Amateur Radio

May 1996
Volume 64 No 5

WIRELESS INSTITUTE OF AUSTRALIA

Journal of the Wireless Institute of Australia

Full of the latest amateur radio news, information and technical articles including...

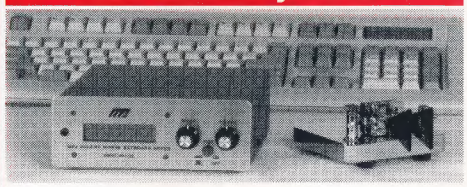
- Review of Kenwood TS-870 HF Transceiver
- Part 3 of Some Useful Wire Antennas for HF
- Beer-Can Antennas

Plus *lots of other articles and special interest columns*

DAYCOM

Australia's Amateur Radio SUPERSTORE!

MFJ Morse keyboards



In the MFJ498, the world's most powerful Morse code keyboard but 32K of lithium battery backed-up memory and a complete code training system, one box! Or you can plug in an iambic key and use the unit as a complete high performance keyer.

MFJ498 32K Morse keyboard & display **$399**

The MFJ452 **'Super CW Keyboard'** has all of the features of the MFJ451 plus a two line LCD display. Nonvolatile memory stores all your messages and settings. Commands can be stored in messages.

MFJ452 Morse keyboard with display **$289**

The MFJ451 stand-alone keyboard has a 200 character type-ahead buffer and two 100 character message memories.

MFJ451 Morse code keyboard **$195**

MFJ Antenna Tuners

MFJ901B	200W Versatuner	$135
MFJ910	Mobile antenna matcher	$42.70
MFJ921	2 mtr 300W tuner	$154
MFJ924	70 cm 300W tuner	$154
MFJ931	Artificial ground tuner	$176

MFJ941E	300W compact GP tuner	$247

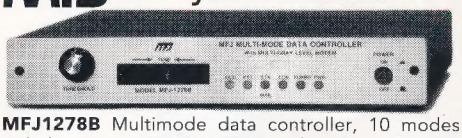
MFJ945D	300W mobile tuner	$198
MFJ948	Deluxe 300W (no D/L)	$292

MFJ949E	Deluxe 300W	$337
MFJ962C	1.5kW tapped inductor	$520

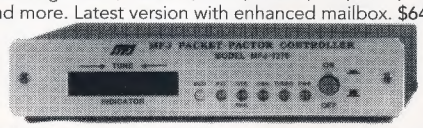
MFJ971	200W Portable tuner	$203
MFJ986	3kW Diff-T roller inductor	$652

MFJ989C	3kW Deluxe roller inductor	$785

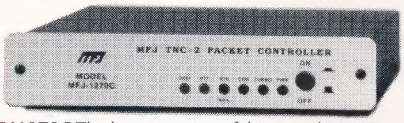
MFJ Performance you can afford!



MFJ1278B Multimode data controller, 10 modes including Pactor, AMTOR, RTTY, Packet, CW, SSTV, FAX and more. Latest version with enhanced mailbox. $649



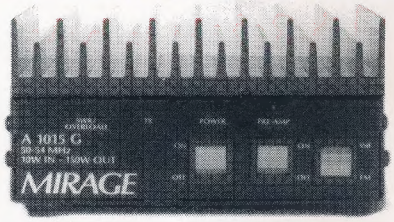
MFJ1276 Packet - PACTOR controller for HF/VHF Packet & HF PACTOR. Best value PACTOR around! $349



MFJ1270C The latest version of this popular VHF packet controller. 32K enhanced mailbox supplied. Best value packet on the market today! $229

MIRAGE

VHF & UHF power amplifiers

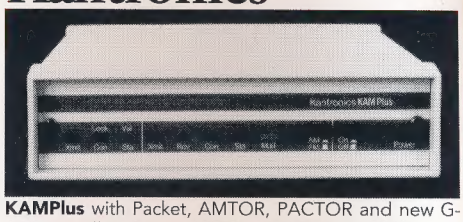


Built in the USA to the highest standards, all Mirage amplifiers carry a full one year warranty from the factory with local service available. High power amplifiers are fitted with copper heatsink inserts. All Mirage amplifiers can be remote-controlled to permit mounting in a convenient location.

MR-A1015G	6mtr 10-150W with preamp	$807
MR-A1035G	6mtr 10-350W with preamp*	$1355
MR-B23	2mtr 2-30W no preamp	$275
MR-B23G	2mtr 2-30W with preamp	$365
MR-B215G	2mtr 2-150W with preamp	$785
MR-B108G	2mtr 10-80W with preamp	$470
MR-B1016G	2mtr 10-160W with preamp	$785
MR-B2516G	2mtr 25-160W with preamp	$660
MR-B5016G	2mtr 50-160W with preamp	$660
MR-B1030G	2mtr 10-300W with preamp	$1425
MR-B2530G	2mtr 25-300W with preamp	$1425
MR-B5030G	2mtr 50-300W with preamp	$1390
MR-B1060G	2mtr 10-600W with preamp*	$2270
MR-B2560G	2mtr 25-600W with preamp*	$2270
MR-B5060G	2mtr 50-600W with preamp*	$2270
MR-D15N	70cm 1-15W no preamp	$415
MR-D26N	70cm 2-60W no preamp	$585
MR-D100ATVN	70cm 1-52W for ATV	$860
MR-D1010N	70cm 10-100W no preamp	$860
MR-D1010ATVN	70cm 10-100W for ATV	$860
MR-D3010N	70cm 30-100W no preamp	$794

Amplifiers marked * require 28V DC supplies, all 2metre amplifiers have SO239 connectors, UHF types have 'N' connectors.

Kantronics



KAMPlus with Packet, AMTOR, PACTOR and new G-TOR as well as CW and RTTY. 128K RAM - **$699**

KPC-3 1200 baud VHF/UHF packet controller in a tiny box with low power consumption — **$249**

KPC-9612 Dual port 9600 &1200bps can operate two radios simultaneously Now with K-NET option **$499**

NEW NEW NEW NEW from KENWOOD

TS-870S HF transceiver with DSP

- IF stage digital signal processing
- No option filters required
- Dual mode noise reduction
- Beat cancellor
- Auto notch filter
- Variable AGC
- Selectable voice equalizer
- Speech processor
- High speed com puter control
- 100W output (SSB, CW, FM, FSK)
- 100kHz-30MHz receiver coverage
- Built-in auto antenna tuner
- 2 antenna sockets
- Dual VFO's with 100 memory chanells

Call for introductory specials!

SUPERSTORE SUPERSPECIAL!

All the HF features of the Kenwood TS-50S! Small size, full 100W output, flexible programming and lots more can be yours this month for just: **$1599**

DAYCOM Communications Pty. Ltd.
44 Stafford Street, Huntingdale 3166

Bankcard, MasterCard & Visa all welcome

Phone (03)9543-6444
FAX (03)9543-7238

Copyright © 1995 Daycom Communications Pty. Ltd. All rights reserved. Prices do not include freight or insurance, are subject to change without notice and are valid during month of publication only. ACN 081 819 949

Amateur Radio

Journal of the Wireless Institute of Australia

Vol 64 No 5 ISSN 0002-6859 May 1996

Amateur Radio is published by the Wireless Institute of Australia, ACN 004 920 745 as its Official Journal, on the last Friday of each month.

PUBLICATIONS COMMITTEE

Editor
Bill Rice VK3ABP

Production Editor
Bill Roper VK3BR

Senior Technical Editor
Peter Gibson VK3AZL

Technical Editors
Evan Jarman VK3ANI
Gil Sones VK3AUI
Bob Tait VK3UI

Marketing
Norm Eyres VK3ZEP
Bruce Kendall VK3WL

Contributing Editor
Ron Fisher VK3OM

ASSOCIATE EDITORS
Technical
David Brownsey VK4AFA
Don Graham VK6HK
Peter O'Connor VK4KIP
Phil Steen VK4APA
Roy Watkins VK6XV

WIA News
Roger Harrison VK2ZRH

PROOF READERS
Allan Doble VK3AMD
Jim Payne VK3AZT
Graham Thornton VK3IY
John Tutton VK3ZC

DRAFTING
Vicki Griffin VK3BNK
Bill Roper VK3BR

ADVERTISING
June Fox

CIRCULATION
Sue Allan
Rita Trebilco VK3HER

TYPESETTING AND PRINTING
Industrial Printing and Publishing Pty Ltd,
122 Dover Street, Richmond, VIC 3121.
Telephone: 9428 2958

MAIL DISTRIBUTION
Mail Management Australia Pty Ltd,
88 Herald Street, Cheltenham, VIC 3192.

***AMATEUR RADIO* CORRESPONDENCE**
All contributions and correspondence concerning the content of *Amateur Radio* should be sent to:
Postal address:
Amateur Radio
PO Box 2175
Caulfield Junction VIC 3161
e-mail address: (column material only)
vk3br@c031.aone.net.au

REGISTERED OFFICE
3/105 Hawthorn Road
Caulfield North VIC 3161
Telephone: (03) 9528 5962
Fax: (03) 9523 8191

Business Hours: 9.30 am to 3 pm weekdays

Deadlines	**Editorial and Hamads**
June	13/05/96
July	10/06/96
August	08/07/96

Delivery of AR: If this magazine is not received by the 15th of the month of issue, and you are a financial member of the WIA, please check with the Post Office before contacting the registered office of the WIA. ©

© *Wireless Institute of Australia 1996*

CONTENTS

Technical

Equipment Review – Kenwood TS-870 All Mode HF Transceiver ____ 6
Ron Fisher VK3OM

Some Useful Wire Antennas for HF – Part 3 ____ 11
Rob S Gurr VK5RG

Beer-Can Antennas ____ 16
Sakari Mattila VK2XIN/OH2AZG

General

Submission on Licensing: Concerns and Questions Addressed ____ 19
Roger Harrison VK2ZRH

Australia Day Honour for Amateur ____ 23
Don Hopper VK7NN

Columns

Advertisers Index ____ 56
ALARA ____ 26
AMSAT Australia ____ 30
Awards ____ 26
Club Corner ____ 31
Contests ____ 31
Divisional Notes
VK1 Notes ____ 36
VK6 Notes ____ 36
VK7 Notes ____ 37
Editor's Comment ____ 2
Hamads ____ 54
HF Predictions ____ 52
How's DX? ____ 38
Intruder Watch ____ 42
Ionospheric Update ____ 47
Over To You ____ 41
Packet World ____ 43
Pounding Brass ____ 46
Repeater Link ____ 44
Silent Keys ____ 45
Spotlight on SWLing ____ 48
Stolen Equipment ____ 42
Update ____ 45
VHF/UHF – An Expanding World ____ 48
VK QSL Bureaux ____ 35
WIA News ____ 3, 10, 15, 18, 35
WIA – Divisional Directory ____ 56
WIA – Federal Directory ____ 2

Cover

Formally offering the Icom IC-706 transceiver prize in the WIA's 1995-96 Membership Recruitment and Retention Campaign is Icom (Australia) managing director, Kiyoshi Fukushima VK3BZX (left), followed by (l-r) Icom staffer, Duncan Baxter VK3LZ, WIA Federal Media Liaison Officer, Roger Harrison VK2ZRH, and Federal President, Neil Penfold VK6NE. The picture was taken by NSW Division Federal Councillor, Michael Corbin VK2YC, at the October 1995 Federal Council meeting at the Ibis Hotel in Melbourne. The Federal Council was fortunate to get Yoshi and Duncan along – they were cajoled into coming the day before, by Val Bergman-Harrison.

BACK ISSUES
Available, only until stocks are exhausted, at $4.00 each (including postage within Australia) to members.

PHOTOSTAT COPIES
When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus $2.00 for each additional issue in which the article appears).

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

Amateur Radio Service

A radiocommunication service for the purpose of self-training,intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society
Founded 1910

Representing the Australian Amateur Radio Service - Member of the International Amateur Radio Union
Registered Federal office of the WIA:
3/105 Hawthorn Rd, Caulfield North, Vic 3161

All Mail to:
PO Box 2175, Caulfield Junction, VIC 3161
Telephone: (03)9528 5962 Fax:(03) 9523 8191

Business Hours: 9.30 am to 3.00 pm on weekdays

Federal Secretary
Peter Naish VK2BPN

Office Manager
Donna Reilly

COUNCIL

President	Neil Penfold	VK6NE
VK1 Federal Councillor	Richard Jenkins	VK1RJ
VK2 Federal Councillor	Michael Corbin	VK2YC
VK3 Federal Councillor	Brenda Edmonds	VK3KT
VK4 Federal Councillor	Ross Marren	VK4AMJ
VK5 Federal Councillor	Grant Willis	VK5ZWI
VK6 Federal Councillor	Bruce Hedland-Thomas	VK6OO
VK7 Federal Councillor	Jim Forsyth	VK7FJ

EXECUTIVE

Peter Naish	VK2BPN
Lance Bickford	VK4ZAZ
Rowland Bruce	VK5OU
Neil Penfold	VK6NE

FEDERAL CO-ORDINATORS

AMSAT:	Graham Ratcliff	VK5AGR
Awards:	John Kelleher	VK3DP
Contests:	Peter Nesbit	VK3APN
Education:	Brenda Edmonds	VK3KT
EMC and Standards	Roger Harrison	VK2ZRH
FTAC:	John Martin	VK3KWA
Historian:	John Edmonds	VK3AFU
Honorary Legal Counsel:	George Brzostowski	VK1GB
IARU:	Kevin Olds	VK1OK
Int'l Travel Host Exch:	Ash Nallawalla	VK3CIT
Intruder Watch:	Gordon Loveday	VK4KAL
Media:	Roger Harrison	VK2ZRH
QSL Manager (VK9,VK0):	Neil Penfold	VK6NE
Videotapes:	Bob Godfrey	VK4BOB
ITU Conference and Study Group:	David Wardlaw	VK3ADW
WICEN:	Leigh Baker	VK3TP

SMA LIAISON TEAM

Roger Harrison	VK2ZRH
David Wardlaw	VK3ADW
Neil Penfold	VK6NE

Editor's Comment

Deregulation

Deregulation is a popular buzz-word these days. What does it mean?

To answer the question we need to go back over 100 years to the period when governments, parliaments and people were beginning to discuss who should have the right to own, or at least control, "the means of production, distribution and exchange".

There are two extremes of opinion on this, one which considers the State should control everything and one which considers the State should control nothing. There is a continuous spectrum in between in which the mixture varies through most of the possible combinations.

The State-owned extreme was most closely approached until 1991 by the USSR, and the free-enterprise extreme by the USA. Australia fell somewhere into the "mixed economy" part of the spectrum, with the Labor Party a little nearer the State-control end than the Liberal-National coalition.

While we have had a Labor Government from 1983 to March 1996, there has, nevertheless, been a steady process of reducing the areas of government control and leaving more and more of the management of enterprise to those actually involved in it. This is deregulation; and it may be expected to accelerate under a Coalition Government.

Once, when the government not only controlled all Australian communications systems, but owned and operated the largest player in the game (PMG's Department, Telecom, now Telstra), it made all the rules and thereby restricted any possible competition. Now Telstra has been set up as a limited company and provided with ready-made competition from Optus! Once, the PMG regulations applying to amateur radio prevented amateurs from discussing matters more appropriately the topic of a telephone call. In fact, in the UK, only the licensed amateur could speak into the microphone; and this may still be the case.

Continued on page 55

CONTRIBUTIONS TO *AMATEUR RADIO*

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. *"How to Write for Amateur Radio"* was published in the August 1992 issue of *Amateur Radio*. A photocopy is available on receipt of a stamped, self addressed envelope.

WIA News

Roger Harrison VK2ZRH, Federal Media Liaison Officer

Spectrum Manager Responds to Licensing Submission, Federal Council Plans Final Draft Deadline

In March, the WIA sent to the spectrum manager, Ms Christine Goode, two courtesy copies of the "Exposure Draft" of the Wireless Institute of Australia's Submission to the 38th Parliament on Amateur Radio Service Licensing, which was released in February.

The spectrum manager has acknowledged receipt, writing to the WIA Federal President, Neil Penfold VK6NE, on 29 March. In her letter, she said, *"I have read the draft with some interest and I look forward to discussion with the WIA on these issues at some stage in the future."*

She concluded with, *"I note that you are currently seeking comments from within your own membership on the draft before you consider submitting it to the Minister. I would prefer at this stage to reserve any comments we may have until you have finalised your proposals."*

Neil Penfold has replied to Christine Goode, thanking her for the letter, and welcoming her comments in the future.

In March, the Federal President also wrote to the new Minister for Communications and the Arts, Senator Richard Alston, seeking a meeting at the earliest available opportunity, to establish a relationship, to determine the Government's position and to outline the main thrust of the submission and how the Amateur Radio Service in Australia would be better licensed at lower cost to the Government.

He reminded the minister that a copy of the exposure draft had been sent to him in February and that last year he wrote to the then WIA Vice President, Roger Harrison VK2ZRH, and had issued a press release supporting objections to the proposed licence fees increase and acknowledging that radio amateurs were of value to the community.

In his letter to the minister, Neil Penfold concluded with, *"Once the consultative process within the amateur radio community concludes and our final submission is completed, we will be seeking a further meeting to present it, later in the year."*

As the WIA has identified that the Senate is likely to play a key role if the submission is to achieve its objectives, Neil Penfold has also written to the Shadow Minister for Communications and the Arts, Senator Chris Schacht, and the Democrats' spokesperson on Communications, Senator Vicki Bourne.

The WIA Federal Council is currently considering a proposal on a time frame for evaluating feedback on the Exposure Draft, developing a second draft for further consideration, completing the final draft and timing of submitting it to the Minister for Communications and members of the 38th Parliament.

Having been published as a 16-page supplement in the April issue of *Amateur Radio,* a 2000-word summary and explanation of the Exposure Draft Submission's proposals appears in the May issue of *Radio and Communications* magazine, arranged with Editor Len Shaw VK3ALS by WIA Federal Media Liaison Officer, Roger Harrison VK2ZRH.

Production Editor, Chris Edmondson VK3CE, told *WIA News* that the May issue of *Radio and Communications* includes an Editorial strongly supporting the WIA's submission, urging all amateurs – particularly non-WIA members – to support the Institute and its efforts to achieve reform in the administration of amateur radio in Australia.

Run-on prints of the Exposure Draft Submission supplement from April's Amateur Radio magazine have been provided to all WIA Divisions for circulation to affiliated clubs and groups, and non-members who request copies. Meanwhile, the exposure draft of the submission was placed on the World Wide Web over Easter, courtesy of South Australian Division Federal Councillor, Grant Willis VK5ZWI. It can be located at http://www.vk5wia.ampr.org/federal/subintro.htm.

It is proposed that the deadline for feedback on the submission be the end of June this year, and that a second draft be available for circulation to all WIA Division councils by late August or early September, allowing time for responses to be analysed and any necessary further research arising from that to be written into the second draft. There would then be time for Division councils to discuss the second draft and formulate points for discussion or any formal motions for the October meeting of the WIA Federal Council. Publication and circulation of the final submission is also to be considered.

It is proposed that the final submission be submitted to the parliament in late October or early November, during the spring sitting.

Amateur Radio Issues on World Radio Conferences Agenda

The report of Australia's International Radiocommunications Advisory Committee (IRAC) on the first preparatory meeting for the World Radio Conferences to be held in 1997 and 1999, highlights several items of interest to radio amateurs: wind profiler radars operating near 50 MHz, 400 MHz and 1000 MHz, and simplification of Article S25 of the international Radio Regulations covering amateur radio.

Three delegates from Australia attended the Conference Preparatory Meeting, CPM-96, held in Geneva during February, led by Roger Smith of the Spectrum Management Agency.

Wind profiler radars that detect rapidly rising and falling wind draughts in the vicinity of airports, blamed for many aircraft crashes around the world, operate on three key frequency ranges which detect air turbulence structures in these hazardous "wind shears". Consideration of these radars is on the agenda for the 1997 World radio Conference, WRC-97.

The IRAC report said a special technical group, TG8/2, is to continue studies ". . . of the characteristics and requirements of wind profiler radars, to make recommendations as to the technically suitable frequency bands, associated standards and frequency sharing criteria necessary for compatibility with the services that may be affected."

As they need to operate near 50 MHz and 400 MHz, they have the potential to interfere with operations in the six metre and 70 centimetre bands, as has been reported in the American Radio Relay League (ARRL) journal, *QST*, and European amateur magazines. Wind profiler radars operating near 1000 MHz are not known to affect any amateur bands.

A wind profiler radar was installed near Darwin some six years ago and operates just below 50 MHz. Interference to the six metre DX window, between 50.0 and 50.2 MHz, was minimised following action taken by local Darwin operator, Rex Pearson VK8RH, who worked with the cooperative radar manufacturer and operators to set the carrier frequency and pulse repetition rate so that a minima in the radar's sidebands fell around 50.1 MHz.

The 1999 World Radio Conference, WRC-99, will review Article S25 of the Radio Regulations, which concerns the amateur and amateur-satellite services. A specialist study group, known as SG 8, will consider the issue over the next few years. International Amateur Radio Union Vice President, Michael Owen VK3KI, addressed the WIA Federal Council on this issue at its February meeting, this year.

The next Conference Preparatory Meeting, CPM-97, will be held some time early next year, according to the IRAC report. The WIA's delegate on IRAC is Dr David Wardlaw VK3ADW.

Last Chance to Win An All-modes, HF-VHF Rig!

This month provides the last chance to renew your membership, or for non-members to join the WIA, and join in the draw to win a fabulous Icom IC-706 transceiver.

Those who join or renew their membership before 31 May 1996 are eligible to go into the draw for the Icom IC-706 transceiver, worth almost $2500, which was generously donated by Icom (Australia). Those members who had the foresight to join or renew their membership since 1 June 1995 are already in the running to win the magnificent Icom rig. All grades of membership are eligible and members on a three-year subscription, and life members, are included automatically.

The IC-706 rig, one of the latest releases from Icom (Australia), covers all nine HF amateur bands from 1.8 MHz through 28 MHz, plus 50-54 MHz and 144-148 MHz. Delivering 100 watts on all HF bands and 50 MHz, and 10 watts on 144 MHz, the IC-706 features continuous receiver coverage between 30 kHz and 200 MHz and all-modes operation: SSB, CW, RTTY, FM and even AM. The IC-706 can thus be used by all amateur licence grades. The rig was very favourably reviewed in the November 1995 issue of *Amateur Radio* magazine.

The winner will be determined by a draw, to be held in June, and the lucky recipient will be notified by mail. The result will be published in *Amateur Radio* magazine. Of course, should the winner not have a licence – yet – or not have a licence which allows them to use the transceiver's full features, the WIA trusts that they will make responsible use of the equipment. And what an incentive to get that Unrestricted ("full call") licence!

Tell the advertiser you saw it in the WIA *Amateur Radio* magazine!

Have You Got a Licence Renewal Asking For More Than $51?

Isolated examples of amateurs receiving licence renewals which give a "total fee due" of more than $51 are still occurring, according to information received by the WIA.

If you receive an "Offer to Renew", as the notices are now titled, which lists a total fee due which does not come to $51.00, then you are advised to write immediately to your nearest Area Office of the Spectrum Management Agency and bring the error to their attention. Better still, to be on the safe side and ensure your licence doesn't lapse, include a payment of $51.

The same goes for repeater and beacon licence renewals, which should be $24 per individual transmitter (links excluded). Apparently, some incorrect amounts have appeared on repeater renewal notices, which clubs have inadvertently accepted and paid.

Make sure you keep a record when you send your licence renewal payment as delays of up to eight weeks between licence renewal date and actual receipt of the renewed licence have been noted.

For official licence fees, get the SMA booklet RB68A, Apparatus Licence Fee Schedule, June 1995, available from SMA area offices.

Electronics Conference and Exhibition in June

For those amateurs working in the electronics, communications or telecommunications industries, a conference and exhibition to be held in Sydney in June should be of particular interest.

The "Electronics at Work" Expo is being staged at the Sydney Olympics site, the State Sports Centre at Homebush Bay, over 5 and 6 June.

The Expo is being supported by the Spectrum Management Agency (SMA), the Australian Electronics Development Centre (AEDC) and the Australian Electrical and Electronic Manufacturers Association (AEEMA).

The AEDC and SMA (who is responsible for implementing the EMC framework) are supporting practical workshops and an international conference on electromagnetic compatibility (EMC), to be held at the Gazebo Hotel in Parramatta. The series of conference sessions will be complemented by a continuous series of EMC workshops at the Homebush Bay exhibition site. A commuter bus will run between the exhibition and the Parramatta conference sites.

Of particular interest will be a presentation from a world authority on EMC, Don White, the author of 13 books on the subject, as well as a joint presentation on mobile phone interference and medical devices from Dr Ken Joyner, head of the EMC section at Telstra Research Laboratories, and Mike Flood of the Therapeutic Goods Administration.

The manager of the SMA's EMC Standards group, Ian McAlister, said the event will provide an opportunity for attendees to learn, via the associated conference and workshops, of the new arrangements introduced by the Government to contain electromagnetic interference (EMI).

AEEMA will conduct a special seminar session on export opportunities for the electronics industry.

The exhibition will showcase products and services, with industry names such as Alcatel, GEC, Hewlett Packard, Mitsubishi, Motorola, National Semiconductor and Philips Electronics Australia, according to the Expo organisers, The Practical Marketing Group, based in Sydney.

OUTbacker
Antenna Sales International
HF- VHF - UHF MOBILE ANTENNA
HF - VHF - UHF BASE ANTENNA
CB - MARINE - AIRCRAFT

Monoband to Multiband Convert Now, to the all New !
PERTH PLUS
HF Mobile antenna
with 80-40-30-20-17-15-12-10-6-2m included

Also in Stock
Coaxial Cables & Fittings
HF Spring Bases, Trunk and Gutter Mounts.

Outbacker OB8 "Classic"
Outbacker "Junior plus"

Split Models
Helical Dipoles
Long wire Dipoles
Baluns

Free!
With Every Perthplus Purchase.
1 x AmSoft CD-ROM
'94 Callsign Database
While current stocks, last

Now available from :

MELBOURNE
Daycom Communications
Ph 03 5436444

ALICE SPRINGS.
Farmer Electronics
Ph 089522388

DARWIN.
Intergrated Technical Services.
Ph 089-815411

SYDNEY.
Andrews Communications
Ph 02 6369060

PERTH.
Tower Communications
Ph 4701118

ADELAIDE
Johnston Electronics
Ph 08 2871061

PERTH - Model

For further Information, and for all International enquiries call us direct at ;

TERLIN AERIALS
5 Yampi Way
Willetton W.A. 6155

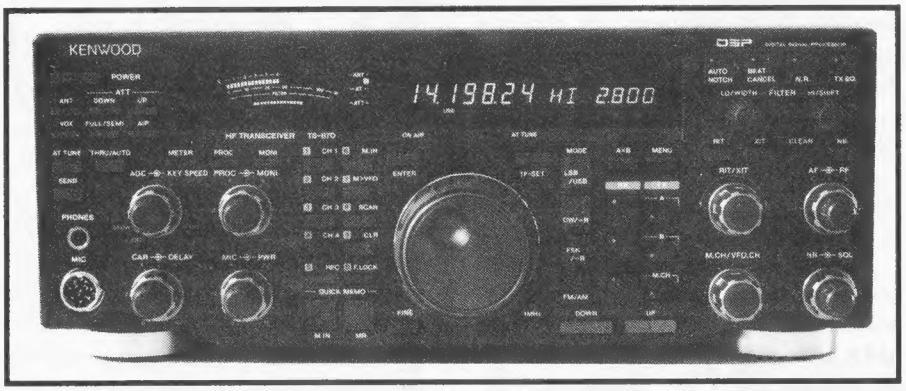
Ph +61 (09) 3545444
Fax +61 (09) 3545455

NEW INFO VIDEO
Send $ 5.00 for a 15 minute informational video
Refundable with every antenna purchase.

■ Equipment Review

Kenwood TS-870 All Mode HF Transceiver

*Reviewed by Ron Fisher VK3OM**



The Kenwood TS-870 All Mode HF DSP Transceiver.

According to the advertising brochure, this is not a transceiver. It is an *Intelligent Digital Enhanced Communications System.* Further, *"You can talk to someone half way round the world and it'll feel like they're in the room with you".*

That's quite a claim to make. Of course, you might need a good antenna connected to achieve the above claim, but they don't mention that. Assuming that a good antenna is connected, will the equipment do as they say? Maybe yes, and maybe no!

So let's see what happens in the real world, particularly as we are now at the bottom of the sun spot cycle. By the way, from here on I am going to call the TS-870 a transceiver. The editor allocates just so much space for these reviews so if I used the full title each time, that would fill the article. Anyhow, with such an exalted title, the 870 must have something going for it, and indeed it does. Let's take a close look at just what the TS-870 has to offer.

TS-870 Features and Facilities

In a nut-shell, the TS-870 is a transceiver with digital signal processing and a "Bay Window" appearance. No, there is more to it than that; but that was my first thought when we first met.

The TS-870 is a mid-sized transceiver and is, in fact, exactly the same size as the TS-850S. I am not sure if the 870 will replace the 850 or if they will run side by side. However, for all practical purposes, it is an updated TS-850. Where the original Kenwood "8" series, the 820 and 830, had built in AC power supplies, the 850 and 870 do not. They both require external DC supplies. The nearest rival to these is the Yaesu FT-990 and this does come with a built-in AC power supply which, in my opinion, does give it a decided edge (it is also available without the built-in power supply if you prefer it that way).

For some unknown reason the TS-870 was available overseas several months before its release in Australia. *Amateur Radio* magazine was the first Australian publication to announce the TS-870 in our *"What's New"* column for December 1995. It was available in the UK at least three months earlier than that. Let's now see just what you get for your money.

As we might expect these days, the TS-870 produces 100 watts RF output, or thereabouts, on all the HF amateur bands. For some reason this doesn't include six metres which is included in many HF rigs these days.

The receiver has full general coverage capabilities from 100 kHz to 30 MHz. All current modes are available on both transmit and receive. From here on, things become somewhat different. The big feature of the TS-870 is the digital signal processing. This operates on both transmit and receive. It allows the operator to set the transmit and receive bandwidths independently, and to boost or cut the top or bottom audio frequencies when transmitting SSB. The big difference between the DSP system used with the TS-870 and other transceivers is that the 870 uses it at IF.

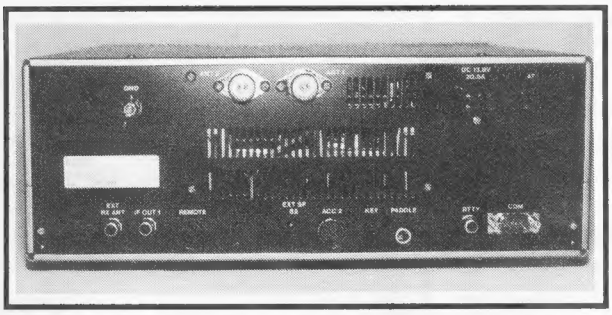
The TS-870 is multiple conversion with IFs at 73.05 MHz, 8.83 MHz, 455 kHz and a new one at 11.3 kHz. This is where the DSP all happens. The feature that first attracted my attention was the controls for the filter on the top right hand side of the panel. To those familiar with Kenwood transceivers, these act like the old SSB slope tuning on say the TS-850 or 940. As soon as an adjustment is made to either of these controls, the display instantly changes from the previous setting (RIT, etc) to show the bandwidth setting.

The bandwidth is also graphically displayed on the meter although there are no calibration points so this acts as an approximate indicator only. The meter is a coloured bar-graph type, similar to the one used on the TS-850 and 450. It has scales for S meter, power output, ALC, SWR, processor compression and the filter width as mentioned above.

The frequency display reads to the nearest 10 Hz and there are something like thirty status indicators built into the overall display. It provides all the information you will need, but I feel it is a bit on the dull side.

The menu system allows you to dim it even further but not to brighten it up. With bright external lighting it could be hard to see. Sunlight shining on it makes it impossible to see. However, I guess no one will be using the TS-870 mobile.

The menu system on the 870 is really something. There is a total of 68 functions that can be set up and all are



The uncluttered rear panel of the TS-870. Note the absence of the usual jutting heatsink on a rig of this size.

displayed on the multi-function display panel. This really enables you to get into the radio and customise it to suit your own requirements. It might take a little time to get used to it as the alpha-numeric display looks a bit strange at first sight; but the handbook explains things very well.

Just to finish off this section of the review, let's look at some of the other functions that the 870 has. There are two VFOs, 100 memories, an automatic antenna tuner, two antenna input connectors switchable from the front panel, selectable tuning rates down to one Hz steps for extra slow tuning, and split frequency operation with both frequencies displayed at the same time.

However, it does not have dual receive capability like its more expensive brothers. In addition to the normal 100 memories, there is a quick memory feature which stores five frequencies in succession. When the sixth frequency is entered the first frequency drops off. This is a useful feature for contests, DXing or just keeping interesting channels on tap.

Computer Control

The TS-870 is all set up for external computer control. According to some overseas information, Kenwood supplies Radio Control Program software with the TS-870 but there was none with our review transceiver. There is an RS232 port built into the transceiver so it's all ready to go. Contact your dealer for more information. It sounds like a great idea.

Rear Panel

Have you ever tried to plug in an external speaker or something at the back of a transceiver and found a large heat sink in the way? Well, no such trouble with the TS-870. There are no projections and all connectors and sockets are easy to get at. There is only one problem, a thirteen pin DIN socket used to connect a TNC or MCP. You will need good eyesight and a steady hand to solder connections to the plug.

General Appearance

I mentioned the Bay Window appearance before. I must admit, it takes time to get used to the look of the front panel. Nothing wrong with it, just different.

But the front feet are a different matter. They look as if they were left over from a job lot of old CD players. When I first spotted them I thought that by rotating them they would screw up or down to adjust the height. But no. If you want the front higher you have to unscrew the feet and add spacers. Really not appropriate for a transceiver in this price class.

On The Air

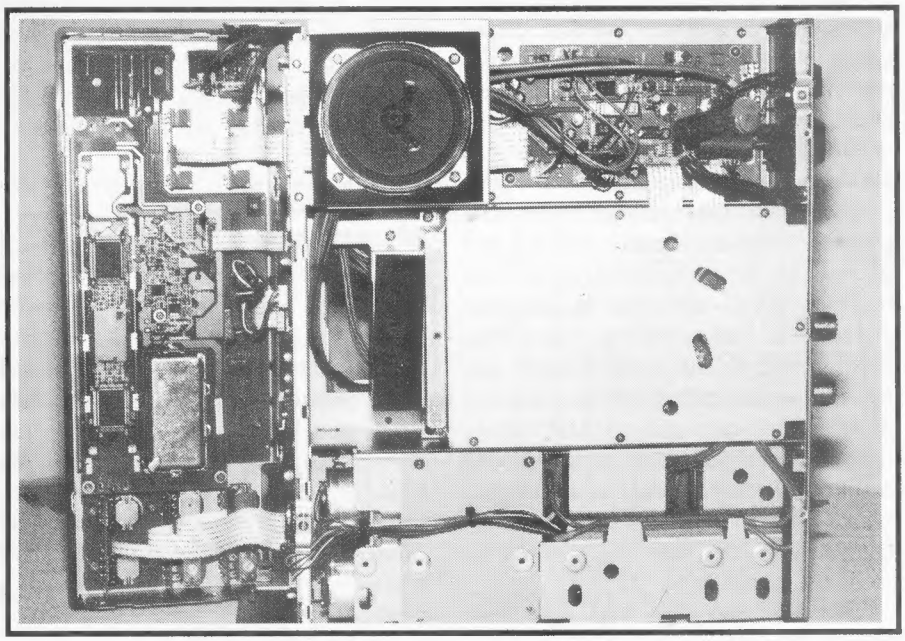
First connect your power supply. The DC connector is a now standard six pin plastic connector. Standard, that is, until you try to buy a spare and you will soon find there are plenty of six pin connectors available that look right but which won't plug in. Strange, isn't it?

You will also note that the specifications call for a power supply with a 20.5 amp rating. I am not sure where that extra 0.5 amp goes, but my ordinary 20 amp (peak) supplies seem to work fine.

One of the first things noted after connecting up is that Kenwood have at long last put a finger hole back in the tuning knob. I think the last Kenwood to have one was the old TS-430S. Let's hope it becomes a standard feature.

This was one time when reading the book came second. Most of the normal controls are very straightforward. Received audio was excellent through the internal speaker and superb through a good external one.

The Lo/width Hi/shift controls work in different ways for different modes. For SSB the "Lo" shifts the low frequency cut off usually in 100 Hz steps where the "Hi" control shifts in 200 Hz steps. The widest bandwidth obtainable on SSB receive is 0 Hz to 6 kHz. I am not sure if the response actually goes down to 0 Hz or not; I didn't make any measurements quite that low!



Top view of the TS-870 with the case removed and the front panel hinged down. Note the cooling fan in the centre, and the auto antenna tuner on the left. The cooling fan was very quiet in operation.

With CW selected, the controls take up their second function, that is width and shift. The width control selects the width of the bandpass and the shift control places that bandpass in the required portion of the audio spectrum. The effect can be followed on the visual bandwidth section of the meter and on the display which indicates the two frequencies selected.

Now to the anti-QRM features of the TS-870. To start with, the controls discussed above play a big part in reducing off-channel interference. The DSP filtering has vertical sided selectivity that can lop off interference with minimal effect on the audio response. The DSP noise and notch controls do the rest.

Of the three controls (auto notch, beat cancel and noise reduction) only one can be selected at a time. The auto notch can take out a single heterodyne with amazing ability. The beat cancel can reduce multiple heterodynes. Note, I said reduce! While very useful, it hasn't the effect of the auto notch. That leaves the noise reduction. Without doubt its main use is for CW and digital modes where it works like magic. For SSB I found that the normal noise blanker was as good and some times better. Of course, you can use the two together for possible improvements.

Note, too, that the auto notch can only be used on SSB while the beat cancel can be used on SSB and AM. The noise reduction can be used on all modes. One slight problem with the noise reduction is that there is no panel control to adjust the degree of reduction.

The fourth DSP button is for SSB transmit audio equalisation which I will discuss in the transmit section. The receiver AGC deserves a mention because of its extreme versatility. Firstly, through the menu system, you can customise each mode to have any desired characteristics of AGC decay time or even switched off all together. In addition, there is a front panel control which allows the decay time to be set from fast to very slow or to switch the AGC off completely.

The RIT on the 870 has been upgraded compared to the TS-850. It is now the +/- 9.99 kHz type as used on the TS-930/940/950 instead of a simple potentiometer with a centre detent. A great improvement.

Now let's start talking. The TS-870 is supplied with an MC-42S microphone so it's just a matter of plugging it in and away we go on SSB.

There are two key sockets, unfortunately both on the back panel. The one for a straight key, a bug or an electronic keyer is a 3.5 mm socket while the one for a paddle is a 6 mm or standard $^1/_4$ inch socket. The straight key socket is a two circuit while the paddle is a three circuit. The in-built keyer has a number of features that will keep the CW enthusiast happy for a very long time. I will run through just a few of its amazing facilities.

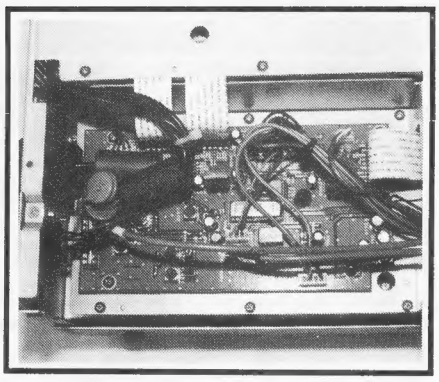
Selectable automatic character spacing, message loop capability for continuous replay, automatic contest serial number generation, and it is programmable via commands sent from the key. Even if you are not a CW enthusiast, try this out. You will be amazed.

There are just as many options available for the phone operator. You can select your transmitted bandwidth, speech processor plus response equalisation. Reports on the transmitted voice quality indicated it was good, but not outstanding. I tried several other microphones with much the same result. Some of the overseas reviews have given rave reports on the transmitted audio. I couldn't duplicate them. In all, a competent performer with more bells and whistles than we have ever seen before.

Kenwood MC-42S Microphone

It seems that this microphone has been around for a long time. Kenwood brought it out when they released their first synthesised transceivers around 1982. During the intervening years they have had both eight and six pin connectors fitted, although the six pin type has disappeared over the last few years. It is still one of the best hand-held microphones supplied with Japanese transceivers. The microphone element is a 600 ohm dynamic unit of better-than-normal quality.

The only thing that goes wrong is that the up/down buttons lose their "click" after a few years of use. Fortunately, the fix is easy. Under each button is a thin layer of rubber (about 1 mm thick) which goes hard. With a thin, sharp, pointed knife cut this rubber away and back comes the "click". There is no doubt this microphone has stood the test of time. It has also been used in slightly modified form with the TS-50S. There seems to be no reason why the MC-42 should not continue for a long time yet.



A close-up of the extensive filtering on the DC input lead to the TS-870.

Kenwood TS-870 On Test

I carried out the usual series of tests including two SSB transmit frequency response tests to check the action of the DSP variable transmit bandwidth control.

However, as usual, the transmit power output and current drain were measured on all bands.

Band	Power Out	Current Drain
1.8	120 watts	18.0 amps
3.6	120 watts	18.0 amps
7.1	115 watts	17.5 amps
10.1	115 watts	17.5 amps
14.2	110 watts	17.0 amps
18.1	110 watts	17.0 amps
21.1	107 watts	17.2 amps
24.9	105 watts	17.5 amps
28.5	108 watts	17.8 amps
29.5	108 watts	18.0 amps

With the power control set to minimum, the power output was 10 watts on all bands.

I then carried out tests to estimate the transmitter intermodulation distortion. As usual, this was done by comparing the test transceiver with a transceiver with known distortion figures. It is interesting to note that intermod tests reported in overseas magazines seem to

vary over wide parameters for the same type of transceiver. As I presume that these testers have access to professional spectrum analysers, I cannot give an answer as to why this occurs.

However, the TS-870 produced the best result of any transceiver so far tested with my standard method. My normal transceiver produces distortion of about -35 dB, but the TS-870 was at least a couple of dB better. It was so good that my reporter had trouble getting a figure because it was so far down.

The transmitter power output was also checked with the automatic antenna tuner in circuit. The loss through this averaged about five watts, although this was very dependent on the degree of mismatch and, in some cases, went as high as ten watts with a 5:1 mismatch on 29.5 MHz.

I decided to carry out two frequency runs on the transmitted SSB response. The first one was at a normal setting that would possibly be chosen by many operators, that is 300 to 2600 Hz. Maximum power was set at 15 watts output and the speech processor was turned off. As can be seen from Graph 1, the result was very smooth with a 3 dB peak at 2 kHz and a gentle drop-off at the low end. At 300 Hz the response was down 11 dB.

The next run was taken with the response set to 100 to 3000 Hz. Note from Graph 2 how the low frequency now extends well down with 100 Hz being -16 dB (referenced to 1 kHz), and how the top end is extended out to 3.5 kHz at -6 dB. The strange thing is that these tests did not show up any reason why the transmitted audio was generally not liked. Being able to set the response virtually to anything you want should produce superb quality.

Again, the few overseas reports I have been able to read about the TS-870 have all commented on the "excellent" transmit audio. No doubt time will tell who is right. By the way, I did try the rig out on the Travellers' Net control stations and they didn't like it either. I used several microphones in my on-air tests, including a Shure 444, Kenwood MC-60, Kenwood MC-50 and, of course, the supplied Kenwood hand microphone. Some were preferred to others but no one found the quality as good as my old Kenwood TS-940.

Carrier and sideband suppression were better than anything measured in the past. My estimate is that they were both in excess of -70 dB which, with the superb intermod distortion figure, all adds up to an extremely clean signal.

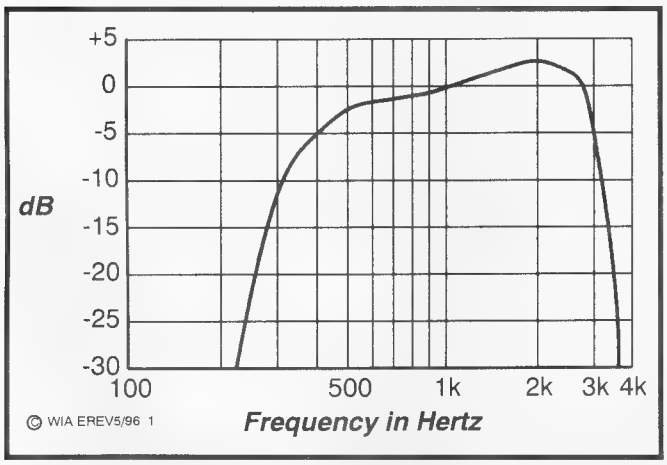
Receiver Tests

The first receiver test was to check the S meter calibration. The meter on the 870 is similar to the type used on the TS-850 and TS-450 and also on a few other Japanese transceivers. It is a fluorescent display with thirty segments between S0 and S9+60 dB. Calibration points are at S 1, 3, 5, 7, 9 and +20, 40 and 60 dB. My figures were taken with the AIP and attenuator off; in other words with full receiver gain and with the receiver tuned to 14.2 MHz.

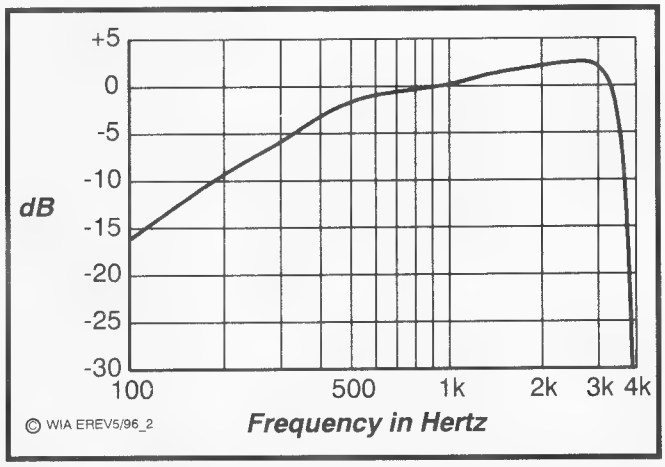
Reading	Voltage
S1	1.0 µV
S3	1.5 µV
S5	3.0 µV
S7	7.0 µV
S9	30.0 µV
S9+20 dB	200.0 µV
S9+40 dB	1200.0 µV
S9+60 dB	.02 volt

The receiver attenuator is switched for -6, -12 and -18 dB. These all measured spot-on, but again I would like to see the addition of at least a -24 dB position. For instance, -18 dB isn't enough attenuation to give meaningful reports on antenna front-to-back measurements.

The AIP gives a gain reduction of about 10 dB. I didn't carry out any receiver frequency response checks for SSB, but a few interesting observations might be in order. The bandwidth, like the transmitter, can be set for any requirement. I found that the best AM reception was obtained in the SSB position with the bandwidth set for 7 kHz. The received audio was flat to nearly 7 kHz and sounded very much better than using the AM mode with 6 kHz bandwidth which only gives a top response of about 3 kHz. However, with the widest bandwidth selected, the AM receive quality is almost Hi-Fi. Here are my measurements:



Graph 1 – Transmit audio response of TS-870 on 14.2 MHz, no compression, 15 watts output at 1 kHz, response set to 300 – 2600 Hz.



Graph 2 – Transmit audio response of TS-870 on 14.2 MHz, no compression, 15 watts output at 1 kHz, response set to 100 – 3000 Hz.

Frequency	Response
50 Hz	0 dB
100 Hz	+2.0 dB
400 Hz	+1.5 dB
1 kHz	0 dB
2 kHz	-1.5 dB
3 kHz	-3.0 dB
4 kHz	-6.0 dB
5 kHz	-12.0 dB

Just try your favourite AM broadcast receiver and see how it compares with that.

Receiver audio output was measured with an eight ohm load connected to the external speaker output. Maximum power was 2.35 watts at 25% distortion. At 2.1 watts the distortion had dropped to 10%, thus exceeding the specified 1.5 watts at 10% by a wide margin. At a normal listening level of 300 milliwatts, the distortion was down to 0.4% which makes it one of the best that I have measured.

The final check was for receiver sensitivity. At 14.2 MHz this measured 0.2 µV with a signal-to-noise ratio of 14 dB, which is slightly better than the specified S/N of 10 dB. The sensitivity actually improves at higher frequencies, going to better than 0.1 µV for 10 dB S/N at 29 MHz. These figures were taken with the AIP and attenuator off.

Of course the technical tests only tell half the story. The ability of the DSP to set the transceiver to suit any conditions or preference of the operator is quite amazing and really sets the TS-870 apart from other rigs.

TS-870 Instruction Manual

Kenwood have gone to a lot of trouble to put this book together. Its 100 plus pages cover subjects you might not expect to find. There is information on short wave listening, a list of the NCDX beacon network, and a full list of HF beacons. Operating instructions cover fourteen chapters and cover such subjects as installation, getting acquainted, operating basics, menu setup and communicating. A full circuit diagram and block diagram are included. I rate the TS-870 instruction 8 1/2 out of 10.

Conclusion

I guess the main feature of the 870 is the fact that you really don't need to buy any extras apart from a power supply. The DSP gives you an almost infinite array of filters that would cost a small fortune in a standard transceiver. In fact, it would be impossible to duplicate the 870 filtering in a normal transceiver. If you are a CW operator then you will find everything here you will need. The Logikey K-1 memory keyer would please the most ardent CW operator. On receive, the DSP noise reduction and selectivity options bring new heights to CW operating.

During my on-air tests with the TS-870, I was asked by two TS-850 owners if they should or should not trade up to a TS-870. As both were SSB operators and only spend a minimal time with CW, I was hard put to give them an answer. In the end, my advice was to stick with what they already had unless they were able to arrange a side-by-side test with a TS-870 to determine if the latest model provided the improvement that they hoped for. I guess this applies to all purchases.

Our review TS-870 was supplied to us by Daycom Communications of 44 Stafford Street, Huntingdale 3166. Current price for the TS-870 is $4,400; the matching SP31 speaker/filter unit is $209; a matching power supply is $720; and the DSP compatible desk microphone is $470. You can phone Daycom for further information on (03) 9543 6444.

** 24 Sugarloaf Road, Beaconsfield Upper, VIC 3808*

ar

WIA News

EMC Standards and the Homebrewer

Many amateurs are keen on making electronic and communications equipment for themselves, either from kits provided by electronics suppliers, clubs or Divisions, or entirely from their own resources, from design to finished assembly.

This activity is an important aspect of self-training, which is fundamental to the Amateur Radio Service, and which the WIA actively supports.

However, some concerns have arisen within the amateur radio community as to how the new electromagnetic compatibility (EMC) standards might affect this aspect of amateur radio activities.

From 1 January next year, makers of electrical, electronic and communications equipment, assemblies and systems will have to comply with standards and regulations on EMC. There has been a "voluntary compliance" regime operating in Australia since 1 January, this year.

Basically, EMC is defined as the ability of electronic devices and systems to operate without harmful mutual interference with other electronic devices and systems.

In Australia, the new EMC compliance framework applies to completed products (whether components, subassemblies or self-contained) offered for open sale, according to Standards Australia.

Kits and home-built equipment are excluded. Ardent homebrewers can breathe a collective sigh of relief.

Compliance with EMC standards and regulations comes under the authority of the Spectrum Management Agency. Standards and regulations are developed in conjunction with Standards Australia and the Radiocommunications Consultative Council (RCC).

In Europe, the European Union's legislation on electromagnetic compatibility, known as the "EMC Directive", came into force on 1 January, this year. In the United Kingdom, the Radio Society of Great Britain (RSGB) had concerns that kits for home construction by radio amateurs would be affected by the EMC Directive to the extent of being subject to expensive independent testing and certification.

The RSGB recently obtained advice from the relevant local authority that kits assembled by UK radio amateurs do not have to comply with the European Union's EMC Directive.

■ Antennas

Some Useful Wire Antennas for HF

Part 3

Rob S Gurr VK5RG concludes his series on wire antennas.*

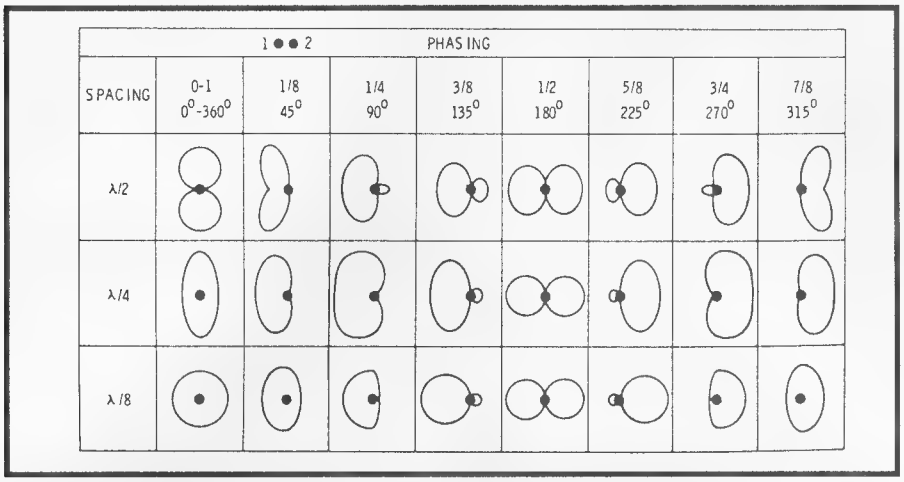


Figure 22 – Radiation patterns for a two element phased array.
(Reprinted from the Radio Handbook, twenty-first edition, page 27-12)

Quarter Wave Sloper

This must be the cheapest effective and useful antenna available. In the simplest form it may be considered a quarter wave vertical, but fed at the top instead of the bottom. The "ground plane" is the support tower and the mass of the other beams and antennas mounted on the tower. I have fabricated a mast clamp that enables me to secure it to the top of a tower, and from this clamp have run a quarter wave wire to a nearby pole or tree. A coaxial cable socket is available to connect the feedline. Tuning is by altering the length of the wire a few inches either way, as guided by an SWR reading, or noise bridge.

The initial SWR should be quite low; however, it may be improved by moving the bottom of the wire from place to place in the yard. Best SWR may sometimes be time consuming to achieve, but it will be worth it. The antenna has a low angle of radiation, and on 7 MHz has provided me with USA contacts that have not been possible on a centre fed dipole. If you have a tower and a spare coax running to its top, this is a "Bonus" antenna.

Full Wave Loop

The use of a full wave horizontal loop at a very low height has become popular throughout the world in recent years. Erection of a large multiband array in a moderate size suburban backyard has been the wish of many hams. Although not large, the full wave loop has a great deal to offer.

In its general configuration, a full wave of wire is suspended (as a square of equal sides), at between three and ten metres above the ground. One corner, or the centre of one side, is fed with open wire line and the array matched at whichever frequency is desired. The radiation is predominantly through the plane of the antenna and, therefore, directly vertical to the ionosphere. This is of great assistance, as reflected power is toward the ground and may spread over up to 1,000 km.

There is a need to consider some aspects of the ionosphere to understand the working of such an antenna:

1. The ionosphere surface is not a clear reflecting plane as is a glass mirror. It is a most uneven surface, with sections so irregular in shape, that reflections may occur at many angles, hence the resultant broad geographic coverage (both on long distance hops or local vertical incidence paths as in this case).

2. There is a frequency above which the radio wave is absorbed by this surface, varying from time to time, season to season, known as the critical frequency.

The overall benefits of such an antenna are, therefore, good low frequency coverage over a local path and at no great expense of supports. Above the critical frequency, at perhaps 14 MHz, random lobes from the horizontal wires, which may have a reasonably low angle of radiation, can give acceptable DX performance.

A number of such low antennas may be used for multiband work. I mention them mainly in the context of their low frequency usefulness. A typical antenna may be erected as a 10 metre-a-side loop on three metre high masts, or on short poles protruding from the top of fruit trees, and give a 7 MHz signal into a nearby state comparable to a full size dipole at 15 metres, used by another ham for DX work. The principle here is never to consider your back yard too small to erect an antenna which will be effective in some way or other! The point at which such a loop is fed is more a matter of convenience than an electrical requirement, although the need to retain symmetry should be observed. I have seen some fed with coaxial cable via a balun; however, the practicality of using it on a number of bands makes the use of open wire line very attractive.

Alternative Forms

I have encountered many of these antennas with a terminating resistor opposite the feedline point, as well as some with an open circuit at this point. These may provide some with an experiment or two to work out the worth of such modifications.

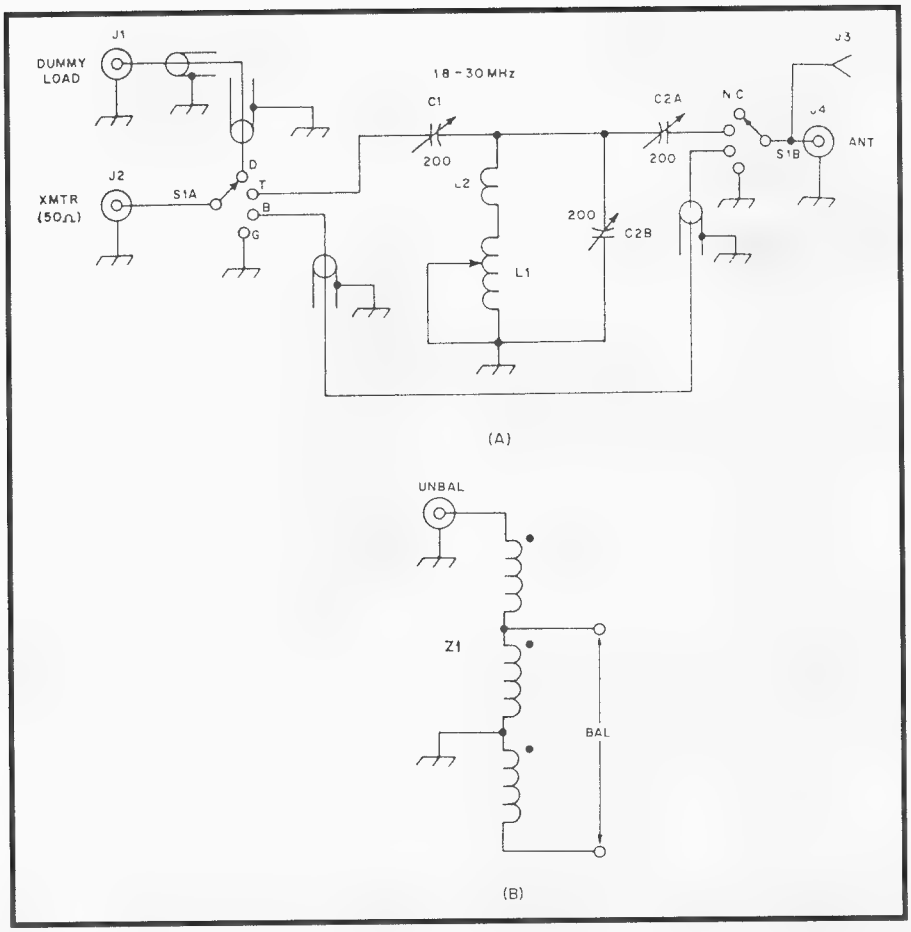


Figure 23 – Schematic diagram of the SPC transmatch. Capacitance is in picofarads.
(Reprinted from the ARRL Handbook, 1988 Edition, page 34-16)

Antenna Tuning Unit

Coupling the feedline of the antenna to a transmitter is arranged through an antenna tuning unit (ATU). This item may be treated as a "black box" that matches the impedance found at the end of our feedline, on the various bands, to the 50 ohm load impedance of our transceivers. The feedline lengths may be chosen to arrange for either a current or voltage node to be present at the ATU terminals, where either a series or parallel resonant tuned circuit would simplify the adjustments.

Modern tuning units of the "SPC" (Fig 23) or "Z Match" (Fig 24) designs are more tolerant to complex impedances and it is not necessary to use "resonant" feedline lengths with these. The components within these ATUs are altered, by the adjustment of the controls, for a reverse power between the transmitter and the ATU of zero. This completes the matching process.

Z Match Antenna Tuning Unit

The Z match antenna coupling unit has been very popular for a number of years, since it was featured in ARRL and RSGB publications, and more recently in *Amateur Radio* magazine. Many units have been described using an assortment of coil dimensions and layouts, including single and two coil set ups, and units to cover from 1.8 to 30 MHz.

I have had success with the RSGB version (Fig 24), which covers 3.5 to 30 MHz only, and have now successfully built a number of these. My modified version has been copied by several VKs, and while the RSGB description gives excellent information on coil construction, the suggested layout gives extremely long leads to the 14-30 MHz range coil, which is overcome in the modified version (Fig 25).

This layout places the higher frequency coil directly between the fixed terminal lugs on the two gang (H gang!) capacitor. On both the RSGB and ARRL circuits, each link is marked for 3.5/7 or 14/21/28 MHz, which has caused difficulties for many constructors, as some feedline lengths present impedances to the coupler which may be matched better by the alternative connection.

I solved this problem by using a 3-position, 2-pole switch which allows the twin feeder to be connected to either link (positions 1 and 2) or to the external terminal mounted on the rear panel of the coupler (position 3). This last terminal allows the twin feeder to be used as a top-loaded vertical antenna on 1.8 MHz through an additional antenna coupler, or as a general coverage receiving antenna.

The coils may be 63 mm and 75 mm in diameter, as shown in the diagrams, and 14 to 16 SWG wire is suitable. The coils should first be wound around a cylindrical former (eg an electrolytic capacitor) of smaller diameter, and then threaded into the holes in the perspex support. A suitable adhesive (eg plastic

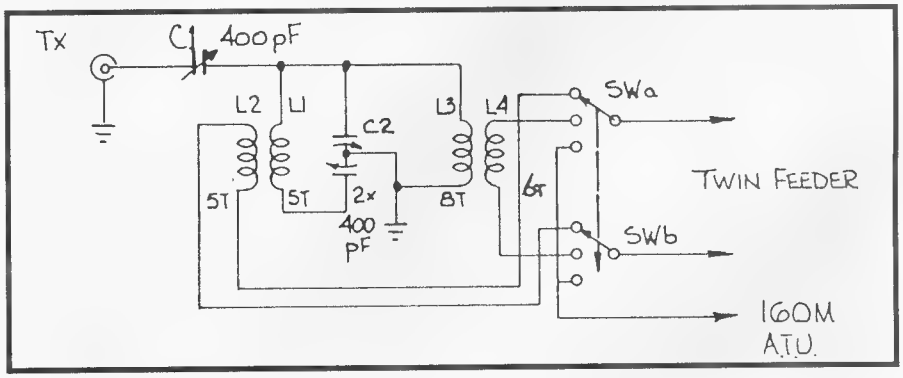


Figure 24 – The Z Match.
(Reprinted from Amateur Radio, September 1984, page 17)

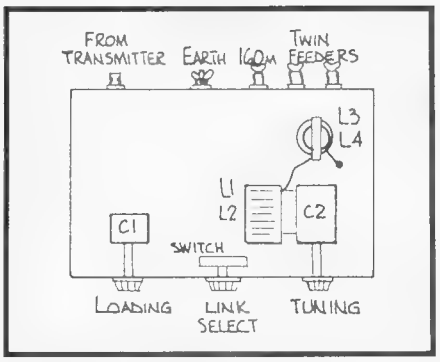


Figure 25 – The Z Match layout.
(Reprinted from Amateur Radio, September 1984, page 17)

cement) may be used to fix the coils in the holes (Fig 26).

For power up to 100 watts, standard single- and two-gang broadcast receiver tuning capacitors are quite suitable, with Stromberg "H" gangs preferred. For higher power, a pair of transmitting variable capacitors, with adequate plate spacing, should be used. Note that C1 needs to be insulated from ground and from the COUPLING control knob. The frame and rotor of C1 should be connected to the transmitter output, while the stationary plates should be connected to L1.

A most essential requirement is the use of vernier dials on the drive shafts of the two capacitors. It is impossible to tune capacitors of these maximum values with the fine accuracy needed to set the match correctly, without such dials.

The "Z" match is constructed on a simple U-shaped chassis, with a second U-shape of perforated metal as a top cover. The front panel controls are LOADING, LINK SELECTION and TUNING.

The unit should be used with a good earthing system. A minimum 1.5 m length of 20 mm galvanised water pipe should be driven into the ground immediately behind the antenna coupler and, from an earth clamp on this pipe, a length of 6 mm^2 or larger copper wire run to the earth terminal on the ATU. One to two metres of wire should be enough. Additionally, bonding of this earth system to nearby water pipes, galvanised steel carports or other metallic structures will improve efficiency when using unbalanced-feed antennas.

RENEW your membership *NOW* - it's your *last chance* to WIN

this fabulous ICOM IC-706 TRANSCEIVER – WORTH $2478 –

HF + 50 MHz + 144 MHz – ALL MODES

• 100 W HF-6m, 10 W 2m • Home/portable/mobile

If your renewal for Division membership is due - *RENEW NOW* - don't delay, don't miss the draw.

This offer was open from 1/6/95, and **ends at close of business on 31 May 1996.**

WHO'S ELIGIBLE?

- current members who renew, or have already renewed, between 1/6/95 and 31/5/96
- persons who join, or have already joined, between 1/6/95 and 31/5/96
- current members who are on a 3-year membership
- life members
- all grades of membership

Encourage others to join so they, too, can enjoy the many benefits of membership – monthly *Amateur Radio* magazine, representation to state, national and international authorities, QSL bureau services, etc.

The prize will be awarded by way of a draw, the result to be published in July 1996. It will be presented to the winner at the earliest opportunity following the draw.

ICOM IC-706 FEATURES

- Covers all HF bands, 160-10m, plus 50-54 MHz, 144-148 MHz
- Continuous receiver coverage 30 kHz-200 MHz
- All modes: SSB-CW-RTTY-FM-AM, all bands
- 100 watts 160-6m, 10 W 2m
- Compact – 167 (W) x 58 (H) x 200 (D) mm
- Detachable front panel
- 102 memories
- Four types of scanning
- VOX, speech comp., NB etc

IC-706 kindly donated by Icom (Australia) Pty Ltd, 7 Duke St, Windsor , Vic 3181. Ph: (03) 9529 7582. Fax (03) 9529 8485.

The WIA trusts any not-yet-licensed Associate member who may win to make responsible use of the equipment.

WIRELESS INSTITUTE OF AUSTRALIA

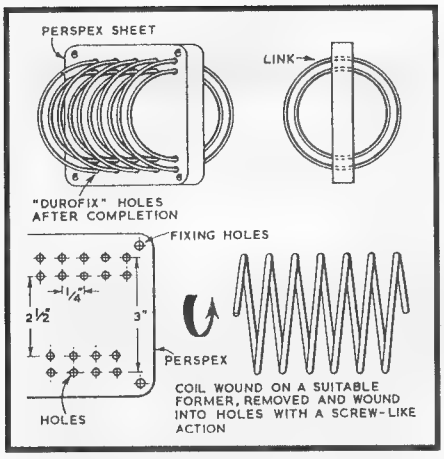


Figure 26 – Coil construction for the Z Match.
(Reprinted from the RSGB Amateur Radio Handbook, third edition, page 369)

Although the Z match will normally be used with balanced lines, I have frequently used it to couple to coaxial cable, and have a standard connector mounted on the rear panel, adjacent to the balanced terminals and suitably insulated from the panel. A small switch or jumper clip may be used to earth the outer of the coaxial socket to the chassis, should this be necessary.

Dipoles

In Fig 27 I have presented 15 ways of feeding a half wave dipole – there are surely more! Few of these may be used with multiband wire antennas; however, all give a great basis for further experimentation with antennas.

It may come as a surprise to a large proportion of readers that there are so many possible methods. I offer them as a starting point for your next antenna matching experiments.

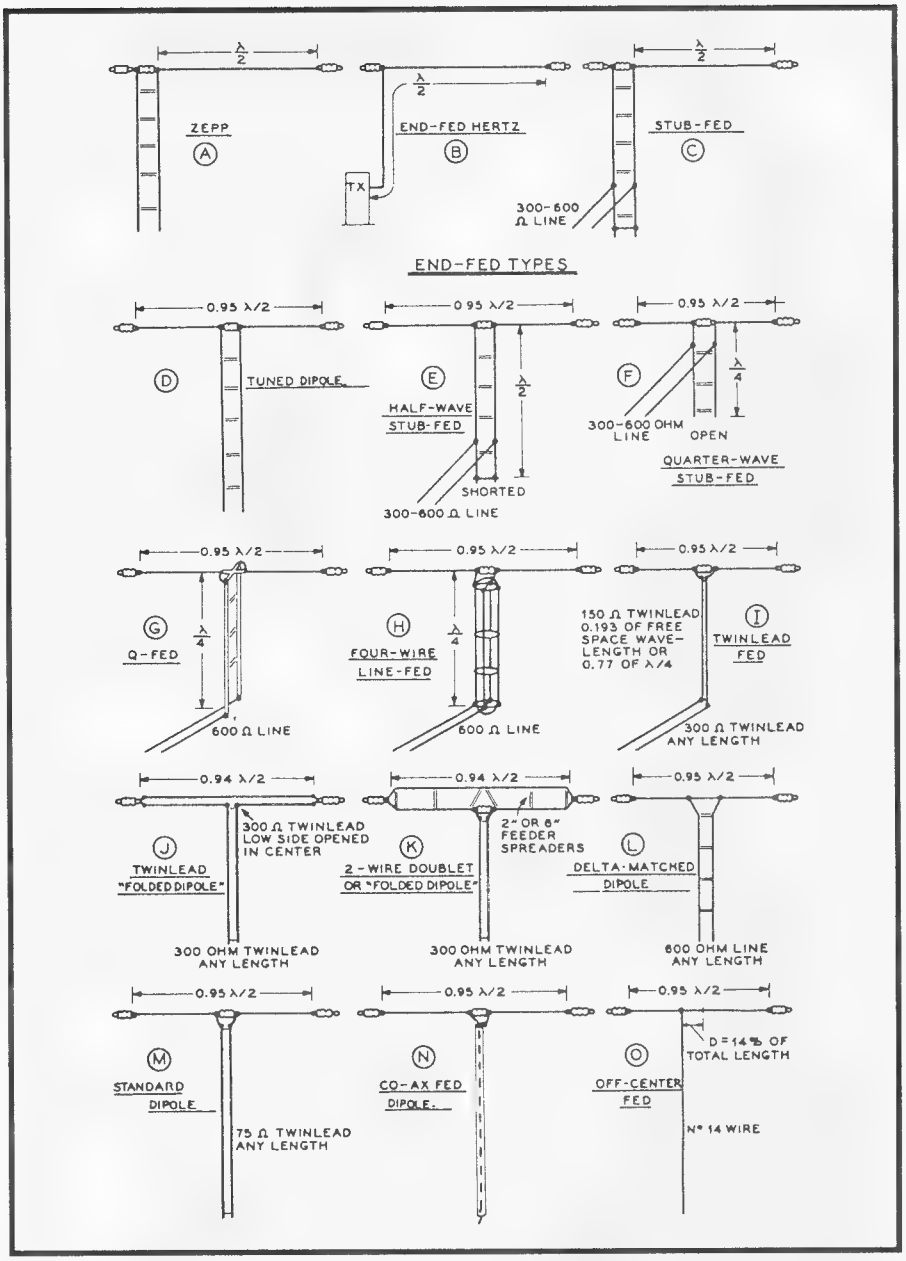


Figure 27 – Feed systems for a half-wave dipole antenna.

Conclusion

I have presented some useful antennas in this article. Some basic details have been supplied and a few hints given on methods of construction. No paper on this very broad subject can be complete in all details; however, I refer you to the list of publications, to read, and conduct experiments with some of my comments in mind.

I am sure you will have plenty of fun, learn a lot about antenna theory, and obtain plenty of contacts with all parts of the world. I cannot help solve the current high frequency propagation problems. However, with a suitable antenna, you should have good contacts when the various bands are open.

Further Reading on High Frequency Wire Antennas

Wire Antennas; Rob Gurr VK5RG, *Amateur Radio* September 1984.

Broadband High Frequency Antennas; Rob Gurr VK5RG, *Amateur Radio* January, 1988

High Frequency Dipole Antennas; Joe Carr K4IPV, *Ham Radio* June, 1989 (p12).

Non-resonant Delta and V Beam Antennas; Robert Wilson KL7ISA, *Ham Radio* May, 1990.

High Frequency Directive Arrays; William Orr W6SAI, *Radio Handbook 20th Ed,* Ch 24 to 29.

Multiband Antennas; Chip Angle N6CA and others, *The ARRL Antenna Book 15th Edition.*

Antenna Projects: John Bloom KE3Z and others, *The ARRL Handbook 1985,* Ch 33.

Novice Antenna Handbook; Doug DeMaw W1FB, ARRL 1988.

W1FB's Antenna Notebook; Doug DeMaw W1FB, ARRL 1987

ZL Special 2 m Beam; Fred Judd G2BCX, *Out of Thin Air,* Practical Wireless.

Horizontal "Zeppelin" Antenna; page R 38, *Handbook of Wireless Telegraphy, 1938* (Admiralty).

ARRL Antenna Compendium Vol 1, 1985 Edition.

ARRL Antenna Compendium Vol 2, 1989 Edition.

ARRL Antenna Compendium Vol 3, 1992 Edition.

Low Band DXing; John Devoidre ON4UN, ARRL 1987.

Antenna Anthology; ARRL 1978.

Practical Wire Antennas; John D Heys G3BDQ, RSGB 1989.

Acknowledgments

The author acknowledges some drawings and diagrams copied from the following publications:
Radio Handbook, Amateur Radio, ARRL Publications, RSGB Publications, and *Ham Radio.*

*35 Grandview Avenue, Urrbrae SA 5064

ar

Gain of V Beam

The author would like to make a slight amendment to Part 2 of this series, on page 7 of *Amateur Radio* for April. Referring to V Beams, it is stated that terminating each end remote from the feed-point with a 400 ohm resistor to ground will produce not only a uni-directional pattern but "a benefit of up to 3 dB additional gain".

On energy-conservation grounds it may be argued that absorbing some power in the resistors, which would otherwise be radiated in a particular direction, cannot increase the power radiated in another direction. The front-to-back ratio will become large, but to expect further gain (approaching 3 dB) is rather optimistic.

It may be, because in the terminated case the current distribution along the wires is a travelling wave, not a standing wave, that the energy-conservation concept is an over-simplification and some additional gain may in fact be possible; but it is likely to be much less than 3 dB.

WIA News

Propagation and Ionospheric Data on the World Wide Web

In addition to high frequency radio propagation and ionospheric data provided by Australia's IPS Radio and Space Services at their own Web site, a new service originating in the United States provides five comprehensive global maps of ionospheric and propagation data on the World Wide Web, updated hourly.

For HF band operators, global maximum usable frequency (MUF) maps are accessible at http://solar.uleth.ca/solar/www/realtime.html.

Global maps of the F2 layer's "critical frequency" – the frequency at which a vertically incident signal will penetrate the F2 layer (known as "foF2") – can be found at http://solar.uleth.ca/solar/www/fof2.html. This data is useful for some computer propagation programs.

Enthusiasts of the 160 and 80 metre bands will find the global maps of E layer critical frequencies (foE) of interest, at http://solar.uleth.ca/solar/www/foe.html. This data is also useful for some computer propagation programs.

Information on the likelihood of propagation over non-great circle paths can be determined from global maps of the height maximum of the F2 layer (known as hmF2) accessible at http://solar.uleth.ca/solar/www/hmf2.html. This is the altitude above the Earth's surface where the electron density of the F2 layer is at its maximum, otherwise known as the F2 layer peak.

Global maps showing the elevation angle of the Sun above or below the horizon for any location on Earth – that is, the "solar zenith angles" – can be found at http://solar.uleth.ca/solar/www/zenith.html. The solar zenith is the point on the Earth's surface where the Sun is seen directly overhead. This changes with the seasons, as the Earth moves around its orbit.

Each map shows the plotted sunrise/sunset line, known as the solar terminator, together with the so-called "grey-line corridor" where the Sun is up to 12 degrees below the horizon, and the solar zenith point, along with the location of the auroral ovals in the northern and southern hemispheres. The auroral ovals locate where aurorae are most likely to appear overhead, given a geomagnetic storm induced by solar particles captured by the Earth's magnetic field, often occurring about 40 hours after an intense solar flare, the particles creating intense, field-aligned ionisation in the ionosphere extending down to heights of 100 km. This information is of particular interest to VHF operators looking for opportunities to exploit auroral scatter propagation on the six and two metre bands. The maps of the auroral ovals are based on the latest 24-hour planetary A-index (an index of geomagnetic activity), which is updated three-hourly. The greater the geomagnetic activity, the further from the Earth's magnetic poles the auroral ovals expand.

Sign up a new WIA member today – we need the numbers to protect our frequencies and privileges

■ Antennas

Beer-Can Antennas

Sakari Mattila VK2XIN/OH2AZG describes an interesting and effective antenna which is fun to make.*

Maybe the best part of making a beer-can antenna is acquiring the construction material. The main part of the beer-can antenna is an open can, like a neatly opened fruit-can or something similar. The second essential part is the radiator probe, also called a monopole or sonde. The beer-can antenna looks typically like Fig 1 from Ref 3. One can expect gain to be 8 – 12 dB over a dipole, depending on the length of the can. The best design formulas are in the *RSGB VHF-UHF Manual* (see Ref 3).

Beer-can antennas have been made of various aluminium or steel cans but, for best results, they should be made of copper or brass tube with a copper end plate. The end plate should be press fitted or silver hard-soldered to the tube. The tube can also be made of copper or brass sheet. If high performance is important, no tin or lead solder should be left inside the can because it would increase losses in the electromagnetic field inside the can.

The beer-can antenna is fairly broadband and therefore useful for transmitting, typically for more than 10 percent away from the design frequency. Typical VSWR response for a 3.4 GHz beer-can is in Fig 2 from Ref 5. The radiation pattern stays relatively good over the whole useful frequency range.

The bandwidth depends, in some degree, on the length to diameter ratio of the probe. A beer-can antenna can be tuned by varying the length of the probe, using a dielectric sleeve on the probe and a tuning screw just opposite the probe, or using tuning screws like in other waveguide radiators. Usually it is easiest to vary the length of the probe by putting a small brass screw at the end of the probe. A small hole for adjustment can be opposite the probe. The adjustment tool must be removed from the can before testing it otherwise it will detune the antenna.

Beer-can antennas are known as circular horn feeds and are mainly used as a feed for parabolic dish antennas. Fig 1 shows the vertically polarised version. Polarisation is as if the probe was an ordinary half wave dipole antenna. Turning the can 90 degrees results in horizontal polarisation.

There can be two probes, 90 degrees apart, which can be selected individually for vertical or horizontal polarisation, or fed together through a phasing network for right or left hand rotating polarisation.

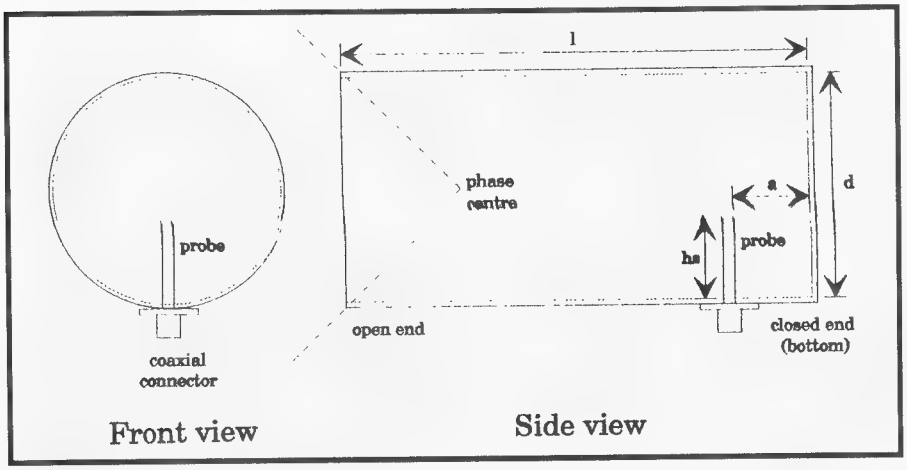


Figure 1 – Basic beer-can.

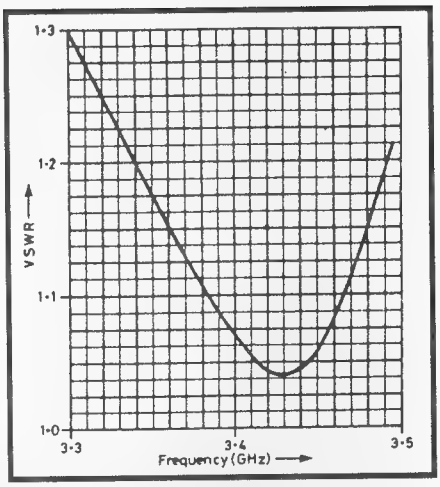


Figure 2 – VSWR versus frequency for a 3.4 GHz beer-can.

Rotating polarisation can also be made using a dielectric (Teflon) vane placed in the front part of the can. Satellite-TV front-ends, also known as LNBs (low noise blocks), use magnetic polarisers (see Ref 17). A magnetic polariser can only give two alternatives, usually horizontal and vertical polarisation.

The beamwidth and gain depend on the length to diameter ratio of the can. A longer can results in a narrower beam and increased gain. There are certain limits for this ratio, but beamwidth can also modified by a scalar ring put on the can near the open end, or a dielectric cone put on the open end like a bullet on a cartridge. The scalar ring, or the dielectric cone, can also improve the radiation pattern of the beer-can radiator by attenuating side-lobes and making the main lobe more suitable to illuminate the parabolic dish.

In Table 1 there are several beer-can designs from 1.2 GHz to 12 GHz. The length is not critical and varies widely with various designs for the same frequency. Beer-cans have been built for the 70 cm band, but are then more like a bucket antenna with a diameter of about a half metre. Some general design rules from various sources are shown in Table 2.

The beer-can antenna has, like all waveguides, a sharp cut-off frequency. Below that frequency it does not radiate at all. The cut-off frequency is when the corresponding free space wavelength is longer than 0.586 times the diameter of the can.

Table 1 – Practical beer-can designs for 50 ohm feed.

l (mm)	d (mm)	a (mm)	hs (mm)	ds (mm)	freq (MHz)	comments
239	165	59	53	3.2	1269	Ref 7
451	152	133	51	3.2	1269	Ref 7 – two sondes (hor/vert)
305	178	102	61	1.6 #14	1269-1296	Ref 10 – FD=0.25-0.5 (Note 1)
231	155	57	45	6	1296	Ref 9 – 130 Deg -10 dB (Note 2)
559	150	140	46	3.2-6.4	1297	Ref 3
175	120	42-48	35	4	1693	Ref 15 – FD=0.4
240	96	33	40		1691	Ref 1 – FD=0.33
160	128	76	36	3-8	1691	Ref 6
107	83	55	29	2	2304	Ref 9 – 130 deg -10 dB (SWR > 2)
312	84	76	25	3.2-6.4	2305	Ref 3
320	100	47	31.5	1.6	2308 #14	Ref 10 – FD=0.25 -0.5 tunable (Note 3)
81	73	29.5	20.4		3430	Ref 5 – FD=0.25 – 0.40
87	58	21	19	2	3456	Ref 9 – 130 deg -10 dB
103	54	21	19	2.6 #10	3456	Ref 4
208	56	51	18	3.2-6.4	3457	Ref 3
175	58	38.5	21.5	5	3800	Ref 11 – FD=0.4 (Note 4)
57	37	13	10	2	5760	Refs 9 & 12 – 130 deg -10 dB
60	38	13	10	2.6 #10	5760	Ref 4
43	25	10	6.6	1	10 GHz	Ref 4 (Note 5)
48	20	9	6	1	10 GHz	Ref 12
77	18	10	x	2	12 GHz	Ref 16 (Note 6) BSB Compact (with Teflon polariser and beam shaper)
105	20	12	7	2.3-2.6	12 GHz	Ref 11 – FD=0.4 (Note 7)

Note 1: This antenna is tunable with a scalar ring; beamwidth can be varied by moving the scalar ring; the probe is made of number 14 copper wire.
Note 2: 10 dB beamwidth is 130 degrees.
Note 3: FD value is the focal distance to dish diameter ratio for suitable reflector.
Note 4: The probe is tunable.
Note 5: The probe is made of the centre conductor of semi-rigid coaxial cable.
Note 6: The probe is part of the LNA printed circuit board, about 2 mm wide extension into the tube.
Note 7: The probe is tunable with a dielectric sleeve.

In the tables, l is the inner length of the can, d is the inner diameter of the can and a is the distance between the probe and the bottom, ie back wall of the antenna. Probe length is hs and probe diameter is ds; f is design frequency; L is the free space wavelength of the design frequency; and G is the waveguide wavelength of the design frequency. FD is the focal distance (F) to dish diameter (D) ratio.

Design rules for a beer-can antenna vary in different books. In the *VHF-UHF Manual* (Ref 3) are the following rules:

1. The diameter of the feed (d), must be more than 0.586 times the wavelength in air (L) at the design frequency.
2. The length of the beer-can (l) preferably should exceed a waveguide wavelength (G), where G = L/sqr(1-(L-43.3*d)*(L-43.3*d)) For d = 0.65L the length should be greater than 2.4 wavelengths; and for d = 0.7L, the length should be greater than 1.8 wavelengths. The thinner the tube, the longer it must be.
3. The radiator probe should be about 3 – 6 millimetres in diameter and have an overall fixed length of about 0.2 L, ie less than a quarter wavelength. It can be tuned as described above.
4. The distance between the probe and the closed end is in the region of a quarter of the waveguide wavelength (G/4); it can be tuned by moving the probe closer to or farther from the closed end.
5. The E-plane (horizontal) 3 dB beam width is 29.4*L/d and the H-plane (vertical) 3 dB beam width is 50.0*L/d. Note that all measurements must be in millimetres. For the d = 0.65L beer-can, the E-plane

Table 2 – General design rules for tubular radiators (beer-can).

Dimensions are in relation to free space wavelength (L) or waveguide wavelength (G); probe diameters are in millimetres.

l	d	a	hs	ds	freq	Comments
1.0-1.5L	0.75L	0.37L	0.25L	–	1/L	Ref 2
>0.8L	0.71L	0.35L	0.23L	–	1/L	Ref 8 (dual-mode)
>2.4L	0.65 – 0.70L	0.25L	0.2-0.25L	3-6 mm	1/L	Ref 3 (d min 0.586L)
0.5G-1.5G	L/1.71-L/1.31	graph	0.20L	3-8 mm	1/L	Ref 6 (graphs & theory)

beamwidth is 46 degrees and the H-plane beamwidth 78 degrees; the mean value corresponds to a focal length to diameter ratio (fd) of 0.56.

A beer-can can be used as a microwave antenna by itself. As a feed radiator it is useful only for a large primary focus dish because the beer-can feed element can shadow the dish too much. With offset feed there is no shadowing, but the dish is more difficult to illuminate evenly. When using it with a dish the focal point of the dish is in the phase centre of the beer-can. The phase centre is inside the beer-can as marked with X in Fig 1.

One of the problems with the beer-can is asymmetry of the horizontal and vertical beam widths. This can be corrected with a scalar ring or a dielectric cone. More about scalar rings is in the DUBUS article (Ref 10), and about polarisers is in *Satellit-TV Handboken* (Ref 11). The Weather Satellite Handbook (Ref 6) contains some theory in addition to 1.7 GHz antenna designs.

References

1. Christieson, M L: Meteosat High-resolution Images. Wireless World, August 1982, p 62

2. Davidoff, Martin (K2UBC): The Satellite Experimenters Handbook. ARRL 1990, ISBN 0-87259-318-5, p 8-12 ... 8-22 (p 6-22 in the previous edition)

3. Jessop, G R: VHF-UHF Manual RSGB, p 9.77 (p 8.65 in the previous edition)

4. Proceedings of the Microwave Update 1987 Conference. ARRL 1987, p 118.

5. Suckling, Charles (G3WDG): Microwaves. Radio Communication (RSGB), May 1983, p 434

6. Taggart: Weather Satellite Handbook, p 2-10

7. The ARRL Handbook 1987, p 23-23 ... 23-25. This part is not included in older or newer editions.

8. UHF & Microwave Experimenter's Manual. ARRL 1991, p 9-31

9. Weiner, K L (DJ9HO) (ed): UHF Compendium, p 373. Two separate books, sold by KM Publications, 5 Ware Orchard, Barby, Nr Rugby, CV23 8UF, UK, price 40.00 pounds.

10. DUBUS 4/89 p 11-15

11. Satellit-TV Handboken 2, p 29, 33. This series of two books describe the building of 4 GHz and 11 GHz television satellite receivers. The books are written in Swedish and date from the early 1980s.

12. Fehrenbach, Josef: Dual-band exciter for 10 GHz and 24 GHz, VHF Communications 2/94, p 111-116. Article describes dual-frequency feeder for parabolic antennas with tubular feed for 10 GHz and E220 rectangular wave guide feed for 24 GHz with common focal point.

13. VHF Communications 1/1976

14. DJ1SL: Tubular radiator for parabolic antennas on the 13 cm band. VHF Communications, 4/1976

15. VHF Communications, 3/1979, p 135

16. BSB Compact satellite TV LNB for 12 GHz satellites with circular polarisation. This LNB contains polariser and conical beam shaper made of Teflon.

17. Badenhauser, R: Outdoor satellite receiving equipment. Elektor Electronics (UK), July/Aug. 1995, p 22-25 – dual-polarity LNBs – magnetic polarisers and dual probe systems.

**GPO Box 742, Sydney NSW 2001*

ar

WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of March 96.

L21012 MR J W LEE
L21013 MR M MEI
L30929 MR D DEVENEY
L50340 MR R JORDAN
L70134 MR L J BAILY
L70135 MR S M CLARK
L70136 MR A BRADSHAW
VK2CGR MR G S RIGG
VK2CT MR S REEVES
VK2DBL MR B A LINSLEY
VK2EEH MR J F KARAS
VK2EFD MR B D GALL
VK2ESL MR S A LISLE
VK2HEX MS C J TAYLOR
VK2HRG MR R A GREEN
VK2HUZ MR T M HUGHES
VK2JHM MR J H MARTIN
VK2KSI MR M BOGOS
VK2LBK MR R F KENNEDY
VK2LEE MR L T NOONAN
VK2MSD MR S M DRAKE
VK2TCL MR D P HARRIS
VK2TFK MR R E EBELING
VK2XDW MR D WILLIAMS
VK2XIS MR S D PAULEY
VK3AMH MR W SADLER
VK3IIL MR R SLOSIAR
VK3JMB MR D PRICTOR
VK3KVT MR V G TAYLOR
VK3MGH MR G HYNES
VK5KEE MR E J WILLIAMSON
VK5VC MR D H BIRD
VK6KRP MR R D PEDRI
VK6ZGO MR B A G WHEELER
VK7CCC MR J W MCCULLOCH

■ Regulatory

Submission on Licensing: Concerns and Questions Addressed

Roger Harrison VK2ZRH, Federal WIA Media Liaison Officer*

With the exposure draft of the submission now well and truly in circulation, thanks to its publication as a supplement in the April issue, this article expands on a number of issues raised in the submission, and addresses some concerns and questions raised by members.

This article has been prompted by constructive comment from Federal Councillors and some Divisional Councillors, together with immediate feedback to the exposure draft from a number of members. Several Divisions have discussed with the author early feedback to the exposure draft, from which it became clear a number of issues could be clarified by further expansion, and some common concerns and questions needed answering. These are addressed by way of a series of summarised questions, with following answers.

What was the point of releasing the exposure draft just before the election? So that it would not "get swamped" in the round of policy launches and party responses, and would be more likely to be noticed during "the quiet before the storm" of election day, Saturday, 2 March, and subsequently remembered post-election. Given the responses from some politicians already, the strategy achieved its basic purpose.

As the WIA has to deal with the parliament in order to have legislative changes to the Radiocommunications Act, the result of the election was immaterial. Releasing the exposure draft before the election, was done to signal that the subject of amateur licensing would be an issue the WIA would be taking up with the 38th Parliament.

Even if a submission were submitted 6-9 months ago (assuming a capable and comprehensive submission could have been assembled at that time), the legislative process would in all likelihood still have been in progress by the time the election was called this year. Amateur licensing would hardly be a top legislative priority. Reality rules, OK?

Why was the submission kept "under wraps" for so long – why weren't details of different parts released for discussion earlier? The submission, or any parts of the draft were not kept "under wraps" at all. A considered reading of Sections 4 and 5 of the exposure draft (on the existing licensing systems and the proposed new amateur licensing system, respectively) shows that the arguments against applying the existing licensing systems to amateurs and the arguments for a new licensing system are interdependent, and themselves dependent on the factual material presented in sections 2 and 3 ("About Amateur Radio" and "The Value of Amateur Radio to the Community").

Justification for the proposed new licensing system depends on the arguments as to why the present licensing systems fails to meet the unique needs of the Amateur Radio Service. Hence, the different parts of the draft submission do not stand alone and thus have to be read as a whole. This is no mere excuse for the time between planning the submission and producing the exposure draft (10 months), but a matter of fact. Experience with submissions shows that parliamentarians, and especially the Government, will reject rhetoric and quite reasonably demand clear argument well supported by factual documentation, notwithstanding what passes for debate in the House.

The searching out and consideration of a large number and wide variety of sources in the assembly of the material pertinent to sections 2 to 5 of the exposure draft was not a linear, step-by-step process. Submissions such as this are not assembled in the same manner as assembling technical documentation for electronic equipment, or for computer software, which is generally a measured, stage-by-stage production process. A framework for the proposed submission was first discussed among the Federal Council and the Divisions in April 1995, a draft circulated to the Divisions and agreed, then released to the Divisions for broadcast and other publicity. The submission framework is reproduced in the accompanying panel. The principles behind the framework detail, to form the argument and proposal, were identified through Federal Council discussion between December 1994 and April 1995.

After the submission framework was released last year, it was not then a question of sitting back and waiting for material to come in, but of actively seeking out sources and solutions and considering their pertinence. In the process, inevitably, a number of "blind alleys" were explored, but at least that revealed what information would not help, and why. Such matters as the possibilities for Class Licensing or Spectrum Licensing of the Amateur Radio Service were considered and rejected for reasons outlined in Section 4 of the exposure draft.

All WIA Divisions were well aware over April and May last year that input to the submission from all amateurs was required, and the submission framework was circulated to them to publicise in any way they saw fit. The framework and call for input was publicised on

Division broadcasts and published on the packet radio network, and was thus widely circulated. Responses from a number of amateurs were received, along with input from Divisional and Federal Councillors in the following months. The publicity was refreshed in November, at the instigation of the Federal Council following a report and discussion at the October 1995 WIA meeting, via a WIA News item issued on 8 November also published in the December issue of *Amateur Radio*.

As a considerable amount of material had been assembled by year's end, the areas needing further information were then apparent and, as talk of a federal election was increasing, a letter was sent to all Divisions asking for further, specific input on the value of amateur radio to the community, with a deadline of 10-11 February. At the suggestion of the Western Australian Division, this was published on the packet network. This exercise resulted in a considerable amount of useful material being submitted.

The idea that amateurs should have a licensing system quite separate from that applying to the commercial, scientific and military sectors is not new. It was certainly a matter of debate when the author first obtained a licence more than 30 years ago, and has waxed and waned over the decades since. When the House of Representatives Standing Committee on Transport and Communications Infrastructure (HORSCOTCI) considered over 1989-1991 moving to a spectrum management system based on commercial/economic concepts, the WIA saw the looming threats to the Amateur Radio Service and argued, in submissions to the HORSCOTCI inquiries, against the application of such a system to radiocommunications services of a non-commercial nature, in particular amateur radio. The basis of the proposed Operators Licence stems from this background.

Why not ask for a Class Licence – the SMA once offered it? The idea of Class Licensing the Amateur Radio Service surfaced in the "kite flying" phase of the SMA's Inquiry Into the Apparatus Licensing System. The contention circulating within the amateur radio community is that, because individual users are not charged a fee under Class Licensing, then Class Licensing for amateurs would mean we'd have a fee-free licence!

The definition of Class Licensing says that individual frequency assignments are not required, and amateurs don't have this; we have bands allocated according to the ITU allocations and the Australian Radiofrequency Spectrum Plan. However, the definition authorises any person "to operate radiocommunications devices of specified kinds". That means type-approved equipment. Class Licences apply to equipment, and/or the purpose for which it is used. CBers operate under the Class Licence system. Equipment must be type approved to be sold in Australia. Cellular mobile telephones are Class Licensed.

One of the strengths of amateur radio is the fact that we are individually licensed, and thus each licensee is known to the licensing authority. Would it be wise to forgo this strength for a fee-free licence? To retain amateur radio's traditions of freedom to experiment, to have individual call signs and to have a degree of self-regulation and all the other privileges we enjoy, yet to operate under the Class Licensing system would be asking to severely distort that licensing system to our ends in order to achieve a fee-free licence. Clearly, such an argument is self-defeating, apart from the ramifications of the effects on the privileges and freedoms so hard won over the years and jealously guarded.

Class Licensing for the Amateur Radio Service in Australia was not rejected out of hand.

Why not ask for a Spectrum Licence? Likewise, Spectrum Licensing for the Amateur Radio Service in Australia was not rejected out of hand. The concept of Spectrum Licensing is comparatively new, legislated into formal existence with the Radiocommunications Act 1992. It confers a licensee a right to use an allocated block of spectrum which is akin to a property right, like that of Torrens Title to real estate. However, it operates more like a lease as the tenure (or "rights to use") is limited to 10 years and the Act confers no presumption of renewal, except where it can be demonstrated to be in the "public good". The spectrum licensee can sub-let his spectrum in whole or in part, charge fees for usage and set conditions on usage. He is effectively the "landlord" of the block of spectrum licensed to him. While a spectrum licensee might come from a "primary user" group (primary uses of spectrum being defined in the Australian Radiofrequency Spectrum Plan), there is no reason why secondary users could not be issued a spectrum licence. As you know, the Amateur Radio Service in Australia is allocated bands variously on a primary user and secondary user basis.

The management of the frequencies allocated under a spectrum license is primarily the responsibility of the licensee. Except under limited circumstances, the SMA plays no part. However, authorities from the Communications Law Centre caution that the rights and entitlements, and responsibilities, of a spectrum licensee are only likely to be sorted out in the courts as the whole concept is new to the law.

Apart from the complexity of spectrum licensing the Australian amateur bands en bloc, there is the question of just who would be the licensee? What about the HF bands, which are shared internationally, and how would we combat intruders on the HF bands if the responsibility for management of our spectrum was thrown entirely onto the spectrum licensee? What about the amateur-satellite allocations, which are also shared internationally? If intruders appeared on one of our primary user allocations, such as happened recently with hang glider enthusiasts from overseas using the 2 m band, would we have to take the offenders to court ourselves for "trespassing" on our spectrum? Apparently, this is an issue yet to be settled in law.

Spectrum Licensing the Amateur allocations in Australia would offer advantages, in so far as technical freedom to experiment is concerned. It would likely strengthen our position in protecting our primary band allocations.

The biggest single drawback of Spectrum Licensing for amateur radio in

Australia is the 10 year tenure limitation, without presumption of renewal. At least Apparatus Licensing offers regular renewal. Every decade we'd be going to the government of the day and attempting to prove renewal would be in the public good. In some ways, that might influence the amateur radio fraternity to keep on its toes. However, in this instance, too, Communications Law Centre authorities caution that the test of public good is only likely to be resolved in the courts. Would we want to be pioneers, here? You know how to recognise pioneers, don't you? They're the guys lying face down with arrows in their backs!

Section 3 on the value of amateur radio highlights some good examples, but surely there are hundreds more – shouldn't these be included, even if summarised? It might be viewed that Section 3 of the exposure draft is a bit "light on", that more detail is better than less. The opposite view could also be taken, that it's too long – no politician has the time to read it.

As the exposure draft is the "first pass" of the submission, key examples for six areas (identified in Section 7 of the framework) were selected for inclusion. A balance of past and recent examples were chosen. Yes, there are hundreds more.

It was felt necessary to clearly demonstrate through specific, factual examples, that amateur radio is, and has continuously been, of value to the community, and indeed returns value to the community.

It is this volume of material which principally supports the submission's contention that no Spectrum Access Tax be levied on radio amateurs, together with the fact that amateur radio is, by definition and law, a non-commercial service. Of necessity, the case must be as strong as we can possibly make it.

In any event, the final submission will include an Executive Summary (see the accompanying panel), which will summarise the proposal and outline the supporting arguments and evidence detailed in the relevant sections.

One area not covered in the exposure draft, but which deserves serious consideration for inclusion in the final submission, is the ability of the Amateur Radio Service to generate and foster international goodwill.

What about licence fee concessions for pensioners and students? The Operators Licence proposal seeks to remove the $10 Spectrum Access Tax, and to reduce the SMA's administrative costs, to further reduce amateur licence fees – below the resulting $41.

The proposal suggests two means of reducing the SMA's identified licence renewal costs, the principal recurrent cost in amateur licensing. That is: a licence term of five years (doing away with the cost of annual renewal notices and licence re-issue), and devolving call sign administration to the WIA. These measures would result in a significant fall in administrative charges, likely to be well below the previous licence fee, thus providing a cost advantage students and pensioners did not previously enjoy, which would flow equally to all

Radio and
Communications
incorporating radio and CB Action

The WiNRADiO is one of the most interesting technical developments for quite some time and - importantly to us - it is Australian made. Designed by Rosetta Laboratories, a Melbourne based operation, this exciting new piece of hardware turns your PC into a high quality comms receiver - for less than $800.
We've tested it and there is a comprehensive review in this month's (May) issue.

But that's not all by a very long shot.
There's a whole lot of reading which will interest both amateurs and hobby communicators - such as:
** A piece from Steve Ireland telling you how to site your HF antenna for best results * A very simple do-it-yourself project on building a multiband antenna * An informative article on getting the best from your NiCd batteries (we confess that we've been doing it wrong but didn't know 'til we read this one)*
** An "abridged" version of the WIA licence submission which is going to the Government*

As we keep saying, a good, well-balanced radio mag is *much* more than just reviews!
This month there are articles on the Internet, high-seas' emergency frequencies, shortwave listening (with a difference), low-band DXing, plus of course all the usual columns.
Don't miss out — it's great reading.

Check your local newsagent today!

(PS. We also have the biggest collection of radio-oriented Classified adverts in the country. There's lots of them because they work so well.)

licensees. Additional arrangements to provide concessions for students and pensioners would likely add some extra cost to the administration of amateur licensing, forcing up the base cost for all. The simpler the system, the better.

Why weren't the IARU and other countries' amateur radio societies asked to write condemning the Australian licence fees and supporting the submission? The Australian Government, as does the government in every country, has sovereignty over the administration of the radiofrequency spectrum within the country's borders and territories. While the amateur bands are allocated by international treaty through the ITU, and the terms of that treaty are, by and large, reflected in the Australian Radiofrequency Spectrum Plan, the ITU treaty does not confer any enforceable obligation on the Government.

A sovereign government has the right to pick and choose how it will allocate and administer spectrum for its country. Countries can and do make frequency allocations differing from the ITU spectrum plans and treaty conditions, but also in derogation of them. Australian Limited licensees having access to the 6 m band is a case in point where, in the past, the Australian authorities acted in derogation of the ITU regulations. New Zealand amateurs having access to a band at 600 MHz, and US amateurs access to a band at 900 MHz, are examples where governments have made allocations differing from the ITU plans.

Given this, expressions of support from the IARU and other countries' amateur radio societies, while possibly providing some "comfort", are not wholly germane to the submission's contentions and arguments. In any case, it would be imprudent to seek expressions of support without the overseas societies knowing what we're seeking and why – which is set out in the exposure draft. Seeking overseas support is a question needing further discussion and evaluation.

Why did the Institute only object to the Spectrum Access Tax in the exposure draft, why not earlier? It was the Institute which identified the Spectrum Access Tax as a key point of objection to the new fees regime proposed by the SMA in December 1994, issuing a press release on 30 December 1994 highlighting this and other issues. That press release was headed "New Tax Hits Community Group". The story was picked up by The Age newspaper and published on 3 January 1995, sparking a run of press stories and comment around the country in the following weeks.

The argument advanced was that the Spectrum Access tax is a tax on knowledge and skill gained through self-training at no cost to the community; the community gains a resource of people having a practical understanding of electronics and communications and related technologies; the knowledge and skills are used to return value to the community through community service in times of emergency and through assisting community events; the knowledge and skills gained through an interest in amateur radio leads young people to take up scientific or technological careers.

The arguments, circulated within the amateur radio community, that the Spectrum Access Tax is for revenue purposes and should not be imposed on amateurs for that reason, that amateurs have never before had to pay a licence tax, that taxes are inevitably increased and amateurs would possibly face massive increases in the future, were

FRAMEWORK for the SUBMISSION

1.0 Introduction

2.0 Scope of this submission

3.0 Executive Summary

4.0 The Nature of the Amateur Radio Service
- ITU definition
- the scope of Radio Amateurs' activities
- the International Amateur Radio Union

5.0 The Wireless Institute of Australia
- structure - the Divisions & Federal WIA
- brief historical background
- role in the Amateur Radio community
- participation in the IARU
- representation role and activities, nationally and internationally

6.0 The Amateur Radio Service and the Radio Frequency Spectrum
- the ITU and Amateur Radio Service allocations
- Amateur Radio Service spectrum allocations in Australia
- Amateur Radio Service spectrum allocations in other countries

7.0 The Value of the Amateur Radio Service to the Community
- self-training in radiocommunications and related technologies
- education of young people in radio and related technologies
- motivating young people to take up scientific/technological careers
- contribution to the advancement of scientific knowledge
- contribution to the development of technology
- providing communications links in community emergencies
- providing communications links for community events

8.0 WIA Representations on Licensing
- prelude to the Radiocommunications Act 1992
- submissions to HORSCOTCI - 1990, 1991
- submissions to the SMA *Inquiry into Apparatus Licensing*
- WIA-SMA consultations during 1994
- WIA meeting with the Parliamentary Secretary to the Minister for Communications, Paul Elliott

9.0 Radiocommunication Licensing Systems under the *Radiocommunications Act 1992*
- Apparatus Licensing
  - purpose
  - advantages
  - possibilities for the Amateur Radio Service
  - limitations for the Amateur Radio Service
- Class Licensing
  - purpose
  - advantages
  - possibilities for the Amateur Radio Service
  - limitations for the Amateur Radio Service
- Spectrum Licensing
  - purpose
  - advantages
  - possibilities for the Amateur Radio Service
  - limitations for the Amateur Radio Service

10.0 A New Licensing System - *The Operators Licence*
- Definition and explanation
- Advantages
- Recommendations
  - administrative arrangements
  - fees regime
  - framework for implementation

found to be flawed and gain little or no sympathy from legislators. All taxes are for revenue purposes (although some taxes are applied for additional purposes, eg regulation of a market, as applies with petrol and tobacco). Taxes don't inevitably increase. An array of various taxes, including personal income and company taxes, were decreased in recent years. The Radiocommunications Act 1983 formally introduced radiocommunications licence fees as a tax. The contentions above, still being advanced, are emotive and easily rebutted by the authorities.

Why not push for removal of the Spectrum Access Tax now, the rest can wait for when the submission's finished? It does our cause more good to have a clearly set out, integrated and self-consistent proposal, eliciting identifiable and well-supported goals seen to benefit both the amateur radio community and the administration of the Amateur Radio Service in Australia, than to take a piecemeal, fragmented approach based on emotive rhetoric which takes no account of the consequences to the whole existing constitution of amateur radio in Australia.

Why wasn't the exposure draft released on packet? The exposure draft consists of almost 100,000 characters (15,000 words). The packet radio network "chokes" on files longer than about 2000 characters; the HF gateways in particular baulk at large files. It would take 50 files of 2000 characters to circulate the exposure draft on the packet radio network.

Alright, some packet operators are in the habit of posting large "documents" as multiple-part bulletins, but the practicality of posting the exposure draft (with some attempt at including the special text highlights) was considered and rejected because it would unnecessarily clog the network to no good purpose when the document was being made available in a more convenient form. It is, however, available on the World Wide Web at http://www.vk5wia.ampr.org/federal/subintro.htm.

*LMB 888, Woollahra NSW 2025

ar

■ People

Australia Day Honour for Amateur

On Australia Day 1996, a Medal in the General Division of the Order of Australia was awarded to Don Hopper VK7NN "For Service to Maritime Safety and Rescue Communications". This award was made to Don in connection with a 12 year involvement with yacht emergencies on amateur radio, and his services as a Volunteer with the Marine Rescue Co-ordination Centre in Canberra.*

Don thinks it may be the first OAM honouring an Amateur Radio Emergency Service. Don's marine communications activities over the years are outlined in the following article, which is a condensed version of a talk he gave in 1995 to Tasmanian amateurs.

I became an amateur in 1981 and was first on air in Madang PNG. I heard Tony's Net, and was shocked to find the flood of illegal stations operating MM (mobile marine).

I discovered that Pacific Island Authorities were issuing licences without examination – Caroline Islands – Solomon Islands – Western Samoa – Cook Islands – Tuvalu (I understand this has now ceased).

Also, unlicensed operators were running MM Nets on amateur radio. For example, Rowdy's Net has been run now for 20 years by TI7RT, Rowdy Taliaferro, an American. First in Hong Kong, then Macao, Singapore and now Phuket. Rowdy will allocate a callsign to any yacht which comes up on his net without a callsign. Usually a TI Costa Rica, EL Liberia or HP Panama.

Many have been the protests I have made to the DoTC (now the SMA) over the years without their efforts producing any results. I suspect that internationally the authorities prefer to have Rowdy operating. Many yachts on Rowdy's Net have been investigated on arrival at their destination.

Emergencies

My first involvement in a MM emergency was when I was in Madang in 1981 and the skipper had malaria. I had the local doctor come to the shack and advise treatment.

My first emergency when I had retired (I had been a marine pilot) was "Big Bear" 5W1DR. This was a call sign issued by Western Samoa without examination. The yacht was in big seas, with strong winds off Moreton Island. He had no charts of the area. I had him take radar bearings and I was able to identify headlands and establish his position. It was too rough to talk him into Moreton Bay so I gave him a course to steer to Mooloolaba.

Another yacht, T2WES, a callsign allocated by Tuvalu without examination, called me from the Coral Sea with the skipper unconscious. A doctor diagnosed cerebral malaria.

The fastest rescue was from the "Windstar", unlicensed for amateur radio. The female crew member, Merin, advised me they were off Suva and the skipper was unconscious. It was nine minutes from the time I advised Canberra until a helicopter was on the way to the yacht.

After handling a few emergencies I was known at the Rescue Co-ordination Centre. The Director asked if I would be a Volunteer with the Centre and handle Marine Emergencies in the Pacific which arose on amateur radio. He explained that, whilst the Coast Radio Stations were their communication medium, they were not permitted on amateur frequencies. I was happy to accept as it was something I understood from my seagoing life, and in retirement I could not have wished for a more interesting project.

Cruising Amateurs

By 1982 practically every yacht cruising the Pacific had amateur radio

on board. They would listen for the excellent weather information on amateur radio and only a minority adopted illegal callsigns. The rest had amateur radio for use in an emergency, which was acceptable under International Regulations.

It was interesting that, during the 12 years I was involved with Marine Emergencies, over half the emergencies were with yachts not licensed for amateur radio. This perhaps indicates the widespread installation of ham radio on yachts for emergency operation.

I asked the DoTC the situation regarding MM Net operation and whether the taking of position reports was taking over the duties of Coast Radio Stations. I also queried the weather information given on amateur radio and whether this conflicted with the duty of the Coast Stations to provide this service. In 1984 I received a reply from the DoTC advising there was no objection to the operation of MM Nets which included the taking of position reports and the passing of weather information. Provided, of course, that radio regulations were observed.

On receipt of this letter I flew to Melbourne and had an afternoon with Mr Gavin Brain in charge of DoTC Regulations. I did this as I had another problem with an anti MM group claiming that the MMs and the nets were involved in breaches of third party regulations and engaging in commercial traffic.

Mr Brain advised me to just keep in mind the financial reward aspect. If, for example, an MM asked someone to phone his stock broker and sell some shares, this was a breach of regulations. The request that mail be redirected to a yacht's next port was not considered a breach.

Pressure

At this time I was a Gold Coast District Councillor with the WIA and we were having considerable pressure from our Federal Councillor and others to push for Morse code to be eliminated or restricted to a small window on 20 metres.

Mr Brain had seen reports of this in minutes of our Annual Meeting of Queensland Clubs. He said he instituted monitoring of 20 metres and was advised that CW was still the most used of all the modes. He commented that if pressure to restrict CW continued he would consider introducing a 60 wpm typing requirement for RTTY mode operation.

Distress

Under International Law and the International Telecommunication Union [ITU] Regulations, a vessel in distress, that is "Mayday", or with emergency traffic where a "Pan" call has to be made, may take any means at its disposal to attract attention, make known its position, and obtain help. As "Hams" our regulations also come under these ITU Regulations.

Distress means the vessel is in imminent danger. A "Pan" call (Urgency) indicates the vessel has a very urgent message to transmit concerning the safety of the vessel or the safety of a person.

On amateur radio, as soon as Distress Traffic commences, amateurs must abide by the International Distress Traffic Regulations. The station in distress, or the station controlling the distress traffic may impose wireless silence on all stations or any station interfering with distress traffic.

When handling distress traffic, I found my biggest problem was the amateurs who kept breaking in with suggestions whilst wireless silence was imposed.

The station in distress is in control of distress traffic but, under ITU Regulation No 3136, he may delegate control to another station. With yachts in distress I always had the yacht delegate control to me. With a merchant ship in distress it was practical for the Radio Officer on board to retain control. However, a yacht distress invariably created a degree of panic with everyone on board involved with the distress. It was, therefore, wiser to delegate control.

At all times I was under the direct instructions of the Marine Rescue Co-ordination Centre in Canberra. If a ham picked up a distress call he immediately phoned MRCC (reverse charge) as required by our Regulations. He would then be told to listen for me on the frequency and I would take over the handling of the traffic. This worked well if the ham knew the Regulations. On many occasions delays occurred when hams, not knowing the regulations, would phone the local police, Coastguard, etc.

With Merchant Ship Distress, strict procedure was followed, with the Coast Radio Stations under the control of the MRCC. However, whilst I operated under the control of the MRCC, strict procedure was not adopted with yacht emergencies. It was often necessary to re-assure those on the yacht and endeavour to be a calming influence.

Emergencies

Often yachts or small vessels in an emergency will call *"Mayday"* and only say *"Am abandoning ship"*. In this instance it is up to the station hearing the distress call immediately to ask him where he is, and obtain other information, if possible, such as the name and callsign of the vessel, the nature of the distress and assistance required, the number of people on board and any other information which may facilitate rescue.

On two occasions I heard *"Mayday, am on fire, abandoning ship"*. I immediately responded with no callsign, *"Where are you, I cannot assist unless you give me your position"*. In both cases they gave their approximate location before abandoning the vessel.

One said *"Michaelous Cay"*, nothing more. It was about 7 pm and dark. I was at sea off Cairns and was unable to raise the local Coastguard or any Coast Radio Station, even when calling *"Mayday relay"*. Finally Auckland Radio answered my CQ call and phoned Townsville Radio for me.

Cairns Coastguard organised a search and one speedboat on the outside of the reef headed for Michaelmas Cay. About six miles nor'east of the Cay they stopped to fill their petrol tank from a four gallon drum. They heard a cry for help and found two men swimming with no life jackets. When their speedboat caught fire, their life jackets were in the bow. As the fire had taken hold they had no alternative but to jump overboard. They sure were two lucky men!

The other instance when I asked where they were, they said *"Off Cape Bedford"*, which is north of Cooktown. My ship was tied up at Weipa at the time. The vessel was a trawler and the two

men were able to get a life raft into the water. They managed to get ashore near Cape Bedford where a freighter saw them next morning and sent a lifeboat in to pick them up.

Complaints

One particular ham on the Gold Coast has an unbelievable hatred of yachties and spent hours every day listening to the MM nets. Whenever he considered there was a breach of regulations he would break in on the net and chastise the alleged offender.

His nose was put out of joint when regulations came into force making it an offence to use a radio to harass a person.

He then collected a group of hams in QLD, NSW and VIC and, between them, they monitored my MM involvement nine hours daily, seven days per week. For six years this group did everything possible to make life miserable for yachties and myself.

However, it was my practice to telephone the DoTC whenever anything arose which I considered might be borderline communications on amateur radio.

For example, I had a call from a yacht off a remote island in the Fiji area. The village water pump broke down and they had no communications with the outside world. The pump engine was an Aussie Southern Cross and a part was required for it. DoTC gave me the OK to order the part. Never once did the DoTC refuse me permission when I had "grey area" communications.

Then the letter writing started, first to the DoTC, then to *Amateur Radio* which published his accusations *(in ignorance of the full story and to show both sides of the argument. Ed).*

Then a letter to me from the Meteorological Bureau advised they could no longer provide me with weather reports for yachts in strong winds and high seas as an amateur had advised them I was breaking third party regulations.

I nominated the ham to the Bureau, denied his accusations and said if I was ever refused weather information for a yacht in strong wind and high seas I would ask the yacht to make the request a Pan call, and the request would go to the MRCC who would have the Met Bureau provide me with the information to pass to the yacht. I continued to receive weather information.

Next came a phone call from Quarantine, asking about third party traffic and whether my advices about yacht arrivals were a breach of regulations. A senior man was sent from Sydney to see me and discuss the matter. I suggested they contact the DoTC for advice. There were no further problems.

The accusations which hurt most were made to Customs. I had been a Volunteer with Customs for 20 years and, when told by Customs that they could no longer accept yacht arrival advices because I was breaking third party regulations, I wrote to the Minister for Customs protesting at this ham's continued vendetta against me and requesting him to seek advice from the DoTC. The Minister wrote to me, clearing me of the accusations and requesting that I continue to support Customs.

Threats

When we moved to VK7, my wife received a letter threatening her and our children if I continued operating amateur radio. I immediately contacted my Federal Police contact in Canberra and gave him the names of the two hams involved with the letter. I do not expect to hear any more from this group.

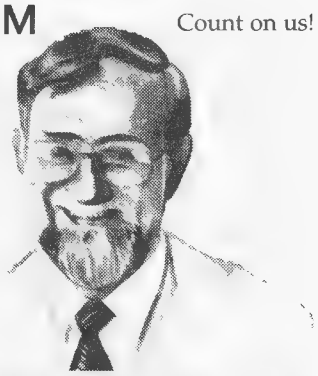
The DoTC did express concern that yachts were not passing arrival messages via the Coast Radio Stations. At least 90% of the yachts I was in contact with were American who only had to have VHF and, therefore, were unable to use the Coast Radio Stations. Our regulations provide that all foreign vessels advise arrival 48 hours prior to entering an Australian port. Amateur radio was their only means for complying with the regulations. Customs in Brisbane commented on one occasion that they had never received a yacht arrival message from a Coast Radio Station.

(So there it is. Don would certainly seem to have earned his medal several times over! Ed)

*Chalet 43, Leisure Garden Estate, Grindelwald TAS 7277

ar

ICOM Count on us!



"VK3LZ calling!"

More sound information from your friends at Icom

THROAT ACTIVATED MICS ATTRACT INTEREST

Our throat activated microphone with ear unit suits most of our handheld radios and is attracting quite a bit of interest among enthusiasts. It's light and easy to use, and comes with both PTT Box and Finger PTT switch.

THE ANNUAL PILGRIMAGE!

The next Queens Birthday weekend Amateur Convention is coming up on June 8 and 9, at Mt.Gambier, S.A. We're looking forward to catching up with our old friends there, and making many new ones of course!

ICOM CAPS ARRIVE

The personalised caps with Call Signs for the first one hundred purchasers of the IC-706 have arrived and are now being distributed state by state. We've been overwhelmed by interest in this radio, so if you don't have your IC-706 yet, don't delay.

A NEW FACE AT ICOM

Our newly appointed National Sales and Marketing Manager is Neville Donohue. Neville's background in the communications field is certainly extensive, beginning with the Army Signal Corps, and then in positions with Motorola, GEC, and Radio Spares Components. Welcome to the Icom team Neville!

"...73"

Call me at Icom on
free call 1800 338 915
ph: (03) 9529 7582
fax: (03) 9529 8485

ACN 006 092 575

L L BROWN ADVERTISING 5526

ALARA

Sally Grattidge VK4SHE, ALARA Publicity Officer*

Welcome to New Members

Carol ZL1AJL sponsored by Judy VK3AGC; Judith ZL1JDL sponsored by Elizabeth VK3NEP; Claureen VK3LCM; June VK6BNK; Nancy VK2 (no call – yet); Margaret ZL3UD sponsored by June VK4SJ. New YL calls – Joycelin Wright VK4HJW and Tina Clogg VK5TMC.

Special Non-Event Station

The latest news on the special callsign for ALARA's 21st Birthday is that VI21ALARA has been refused. At this stage the plan is to do nothing this year, but plan well ahead for the 25th Birthday.

Monday Night Net

This net is back on its later time of 1030 UTC, now that daylight saving is over for another year, on a frequency of 3.580 MHz +/-. Recently, several YLs who have been absent from the net for a while have been heard again.

Robyn VK3ENX, who was ALARA columnist a couple of years ago, moved house about that time, and has only recently found the time to erect the 80 m vertical. Robyn is also well known to the VK3 Sunday broadcast listeners as one of their regular presenters. Welcome back Robyn.

Marjorie VK2AMJ was on the net infrequently last year being very much involved with the "Australia Remembers" activities. Marjorie cannot always hear all the other stations but always has interesting news to share with us.

Bobbie VK2PXS has been a rare voice on Monday nights, largely due to antenna problems, so it is great to hear her again.

It is good to have regular voices on the Monday nets and really good to welcome new voices and "old" ones returning. The range of subjects discussed is amazing, and it is fascinating to see someone's chance remark produce a dozen different stories from all around Oz.

We know we have a number of "eavesdroppers" so, if you are a YL, please join in (ask the OM to call if you don't have a callsign). If you are an OM you are also welcome once the net has had a couple of rounds. Net Control will call you in or ask the last person on the list to do so. If you turn up late and cannot hear many stations, a good plan is to drop your callsign in the pause as a clearly-heard station hands over.

History Again

Last year many YLs were asked to provide a brief history of their involvement with amateur radio. Thanks go to all those who made the effort to put pen to paper. For the considerable numbers who, for various reasons, did not get around to it, it is never too late, so please think about writing those few words when you can and send them to our Historian, Deb Matthews VK5JDM, at PO Box 61, Moana, SA 5169.

VK3 Lunch

The VK3 girls had their first monthly lunch for the year on Friday, 9 February. Mavis VK3KS, Jessie VK3VAN, Jean (whose daughter Rhyl is a skiing instructor in Soda Springs near Reno USA), Marlene VK3WQ (not on her travels at the moment), Bron VK3DYF, and Elizabeth VK3NEP who attended for the first (but not the last) time. Also present was Gwen VK3DYL who is giving the DX scene a bit of attention at the moment (tell us about it Gwen).

ALARA's president Christine VK5CTY, in VK3 for family reasons, brought her daughter Marion, and word from Raedie that she hoped to attend next month's lunch. An enjoyable time was had by all in spite of wet and windy weather (well, it is Melbourne) and with president and secretary (VK3DYF) at the same table some business was discussed, of course. Itinerant YLs are always welcome to the monthly lunches.

Snap Happy

Christine was in Melbourne for her son's 40th birthday and took her OM's camera to record the event as it had a flash. However, the flash would not work so enterprising Christine used 1/4 second exposure instead, without a tripod! OM had removed the batteries to replace them but, guess what, had not got around to it. There is a moral here somewhere.

Westward Bound

The VK5 YLs have had a meeting to see who is going to Perth and how everyone is travelling. It looks like VK5 is going to be well represented. Contact Christine VK5CTY if you want to find out who is going and maybe share accommodation or travel arrangements.

Fox Hunt

Mary VK5AMD was having fox trouble. The cat and the fox caused a disturbance on the verandah. OM grabbed the gun and fired two shots. One got the fox, and the other hit a tomato bush, two water melons and the hose.

VIP

Christine VK5CTY was visiting the school ship Concordia, when someone on board spotted the callsign she was wearing and invited her to view the radio room. Everyone else was allowed on deck only.

Ouch

Judy VK3AGC was bitten on the foot by a jumping jack ant – they have a nasty bite and can jump high enough to get in your gumboots. While resting the sore foot she is crocheting a huge bedspread in many colours which she hopes to finish before the end of the century.

**C/o PO Woodstock, QLD 4816*

ar

Awards

*John Kelleher VK3DP - Federal Awards Manager**

"How's DX" columnist, Stephen Pall VK2PS, has supplied the following information on current Hungarian Awards after a request from the President of the Radio Club in the Town of Gyor, to publicise these awards in *Amateur Radio* magazine. There are four awards.

"Gyor is a 725 year old City" Diploma

This award is issued by the MTTOSZ Radio Club of Gyor, for the 725th anniversary of the city's establishment. The award is available to all licensed radio amateurs and SWLs who meet the requirement of one QSO with HG1G special event station, plus three QSOs with amateur stations in Gyor, or stations who are members of the Gyor Radio Club. This is a list of members: HG1S, HG1H, HG1P, HA1AC, HA1AG,, HA1AH, HA1AL, HA1AQ, HA1AR, HA1AS, HA1BA, HA1DAC, HA1DAD, HA1DAQ, HA1DBO, HA1DBV, HA1BN, HA1DCD, HA1DAE, HA1DCY, HA1DDU, HA1KSA, HA1KTK, HA1SC, HA1SD, HA1SF, HA1SN, HA1AV, HA1SW, HA1SX, HA1SZ, HA1TG, HA1TJ, HA1TK, HA1TO, HA1TS, HA1TV, HA1TW, HA1TX, HA1UC, HA1UD, HA1UF, HA1UK, HA1US, HG1DAI, HG1DAM, HG1DAS, HG1DAU, HG1DBB, HG1DBH, HG1DBJ, HG1DBP, HG1DBU, HG1DBX, HG1DBZ, HG1DCA, HG1DCC, HG1DCG, HG1DCH, HG1DCJ, HG1DCK,

HG1DCX, HG1DDG, HG1DDH, HG1DEF, HG1DEH, HG1DEM, HG1DEZ, HG1DFJ, HG1DSP, HG1SJ.

QSOs made between 1 January 1996 and 31 December 1996 are valid for the award. There are no band or mode restrictions. It is not necessary to attach QSL cards with the application, but a copy of your log list has to be validated by two other licensed amateurs.

Applications for this award will be accepted no later than 31 December 1998. The fee is $US5.00 or 10 IRCs. Please send your application to: MTTOSZ Gyor Varosi Radioklub, H-9002 Gyor, Pf79, Hungary.

PANNONIA Award

This award is issued by the Radio Club of Gyor on a worked or heard basis after 1 January 1996.

DX stations have to submit verification of eight contacts from HA1-2-3-4 call areas, comprising two contacts from each call area, on two bands.

The fee for the award is $US5.00 or 10 IRCs. QSL cards are not necessary, but a list verified by two other amateurs is absolutely necessary. Send applications to: The Award Manager, Radioklub Gyor HA1KSA, 9002 Gyor POB 79, Hungary.

Conquest Diploma

This award is issued by the MTTOSZ Radio Club of Gyor, on behalf of, and with the authority of the Hungarian Amateur Radio Society, to celebrate the 1100th anniversary of the establishment of Hungary as a nation.

The award is available to all licensed radio amateurs, and SWLs providing they meet the requirement of one QSO with the HG1H special event station, plus one QSO with amateur radio stations in each of Hungary's callsign regions HA/HG 1-0, a total of 11 QSOs.

Any of the callsign regions can be substituted with one of the "Joker" stations HG96HQ, HG1G or HG1P. QSOs made between 1 January 1996 and 31 December 1996 are valid for the award.

There are no band restrictions. The valid modes are CW, SSB, Mixed CW-SSB-RTTY-AM-FM. The basic award can be applied in any category of the above three modes. It is not necessary to attach QSL cards to your application but your list must be verified by two other licensed amateurs.

Applications will be accepted no later than 31 December 1998.

The fee for the award is $US5.00 or 10 IRCs. Please send your application to: MTTOSZ Gyor Varosi Radioklub, H-9002 Gyor, Pf 79, Hungary.

The Conquest Diploma, a colourful A4 size certificate.

PANNONHALMA Diploma

This award is issued by the MTTOSZ Radio Club of Gyor, to celebrate the 1000th anniversary of the establishment of the Abbey of Pannonhalma.

This award is available to all licensed radio amateurs and SWLs if they meet the requirement of one QSO with the HG1P special event station, plus five QSOs with amateur radio stations in the Gyor-Moson-Sopron county. These are HA1 A..B..S..T..U..DAA-DIZ and HG1S, HA1KSA, HA1KTD, HA1KSO, HG1H, HG1G, HG1KSQ, HA1KSS, HA1KTK.

QSOs made between 1 January 1996 and 31 December 1996 are valid for the award. All amateur bands and modes – no band restrictions. It is not necessary to attach QSL cards with the application, but a copy of your log has to be validated by two other licensed amateur operators.

The application may be sent not later than 31 December 1998. The fee for the award is $US5.00 or 10 IRCs. Please send your applications to: MTTOSZ Gyor Varosi Radioklub, H-9002 Gyor, Pf 79, Hungary.

I thank Stephen Pall, and the President of the above Radio Club for this contribution.

For those interested in working US Counties for the USCA award, I have printed out a complete listing of these counties, which can be obtained by sending an oversize SASE and a couple of IRCs to cover printing costs.

*PO Box 2175 Caulfield Junction 3161

ar

Prevent pirates – make sure you sell your transmitter to a licensed amateur

COM-AN-TENA

(formerly A. J & J Coman Antennas)

6M std 6 ele 40 mm boom	$216
2M co/linear 2 5/8 7dbd	$ 97
12 ele 2M broad B/width	$135
160M vert top loaded	$327
6 M co/lin 6 dbd rad 4.NEW	$157
6 ele 6 M N.B.S 50 mm Boom	$310
Duo 10-15 M	$295
3 ele 15 M	$199
3 ele 20 M	$333
20 m log-yag array 11.5 dbd	$755
M B Vert NO TRAPS 10-80 M	$275
Tri band beam HB 35 C 5 ele	$690
40 M linear loaded 2 ele	$516
13-30 M logperiodic 7 ele 7.62 Boom all stainless/steel fittings	$730
70 cm beam 33 ele 19.9 Dbi	$228
23 cm slot fed 36 ele brass cons s/solder-assembled. 18 dbd	$170
80 m top load/cap/hat vert.	$260
80 m rotatable dipole lin/loaded	CALL
2 m 144.100 2.2 wavelength boom	$145

PLUS FREIGHT

BANKCARD MASTERCARD & VISA ACCEPTED

Call ANDY COMAN VK3WH.

LOT 6 WEBSTERS ROAD, CLARKFIELD 3429

PHONE 054 285 134

FT-1000MP

YAESU Is About To Turn The World Of HF Transceivers On Its Head!

Dedicated to the memory of JA1MP, the founder of Yaesu Musen, we are proud to announce the release of Yaesu's latest high performance HF base transceiver, the new FT-1000MP.

Based upon the legendary performance of the FT-1000 which, for more than half a decade, has been highly acclaimed by the world's top DXers, Yaesu has created a new 100W HF masterpiece built upon proven RF design and the introduction of a new technology to the Amateur marketplace: Enhanced Digital Signal Processing (EDSP). Teamed up with Direct Digital frequency synthesis, an outstanding receiver section featuring a high intercept front-end and a wide variety of IF filters (including a Collins Mechanical Filter), the FT-1000MP's exclusive EDSP facilities provide an impressive array of IF-based noise-reduction and interference rejection filters for enhanced receiver performance, as well as flexible tailoring of the transmitter for outstanding signal clarity.

The performance of digital processing systems is highly dependent on the quality of software inside the receiver, and here Yaesu's experience with software design really shines through. Yaesu's IF-based EDSP provides 4 random-noise filtering protocols, audio enhancement with 4 equalisation programs for Tx and 3 for Rx, and an automatic notch filter which identifies and eliminates multiple interfering carriers or heterodynes. Front panel selectable EDSP filter contours (Low, Mid, or High-Cut responses; or Bandpass) aid in QRM rejection, providing improved signal-to-noise ratios and razor sharp selectivity. A comprehensive menu system allows you to easily hear the effect of various EDSP settings, so you can choose the best selection for your operating conditions.

In keeping with the improvements that the EDSP facilities provide, the FT-1000MP also provides new features such as selectable flat response or optimised receiver front-ends, 3 antenna connectors (2 main antennas and an Rx-only socket), selectable tuning steps as small as 0.625Hz, and a Shuttle-jog tuning knob for fast QSY operation. For optimised transmit audio, different SSB IF offsets can be set for both normal and RF speech-processed transmissions, and can be used in conjunction with the Tx EDSP functions. Separate bar-graph S-meters are provided for each receiver, and even a synchronous detection system is used for better AM reception on the Shortwave bands.

Standard features include SSB/CW/AM/FM operation, an in-built AC power supply and Automatic antenna tuner, 13.5V DC socket, dual-mode noise blankers, 500Hz CW and 6kHz AM IF filters, full break-in CW, an in-built electronic keyer with memory, a multi-colour high resolution display, an RS-232 computer interface, and a MH-31B8 hand microphone.

With the new FT-1000MP due to arrive soon, now's the time to call us for a copy of Yaesu's 12-page colour booklet explaining more about the FT-1000MP's new level of HF performance and design excellence. We're sure you'll soon agree that the world of HF transceivers has just taken a giant leap forward.

Cat D-3400

$4495

Due mid-June

2 Year Warranty

B 2396

For further information, orders or the location of your nearest store call:

Sydney Area: 9937 3366
Outside Sydney (FREECALL) 1800 26 3922

DICK SMITH ELECTRONICS

AMSAT Australia

*Bill Magnusson VK3JT**

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI
AMSAT Australia net:
Control station VK5AGR
Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies (again depending on propagation conditions):

Primary 7.064 MHz (usually during summer).

Secondary 3.685 MHz (usually during winter).

Frequencies +/- QRM.

AMSAT Australia newsletter and software service
The newsletter is published monthly by Graham VK5AGR. Subscription is $30 for Australia, $35 for New Zealand and $40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

New AMSAT Body Formed in France

The following item appeared recently on CompuServe.
Forum: HamNet <Ham Radio>
Section: Amateur Satellites
Subj : BIRTH OF AMSAT FRANCE
To : Scott W3VS [SysOp], 76703,407
Friday, March 08, 1996 8:25:31 AM
From : MERCIER CHRISTOPHE, 100450,3167 #447355

BIRTH OF AMSAT-F

We are pleased to announce the official birth of AMSAT-France. The president of AMSAT-F is Bernard Pidoux F6BVP.

First aim of AMSAT-F is to support amateur projects like PHASE-3D and MAELLE.

We can also announce that our AMSAT-F homepages are available at: http://ourworld.compuserve.com/homepages/AMSAT_F

It is presently a French "beta" version, but the English translation will be soon published, probably in a couple of weeks. We are also thinking of a German translation!

For more information, please contact:
AMSAT-F
14 bis, rue des gourlis
92500 Rueil Malmaison
France
Email : 100450.3167@compuserve.com

Phase 3D Update

Volumes have been written about the progress of this new bird. With the launch slated for some time this year it's time to summarise the story so far.

With the successful launch of AO-13 in 1988, it was decided to review the future directions of AMSAT. There were preliminary plans afoot for a new generation of geo-synchronous orbit amateur radio satellites, the so-called Phase 4 fleet, to follow the Phase 3 birds. Sadly, the funding analysis revealed that it was beyond the resources of the amateur body to bring this to fruition and it was shelved. It would have required three such satellites to give global coverage and the funds were not available to build and launch even one.

It was then decided to continue with the Phase 3 program but to make the next Phase 3 bird something special. Not just a copy of AO-13 but a very much up-market version with more features, more power and more frequencies. The idea of separate transponders for each mode was abandoned and replaced by a matrix concept. P3D will have a number of receivers and a number of transmitters which can be coupled together in an IF matrix switching arrangement allowing many different combinations to be configured.

Whilst the orbit will be substantially the same as previous Phase 3 birds, the stabilisation will be radically different. Three reaction wheels will control the attitude of P3D so that its antennas will constantly point towards the earth. This will not only give much better communication but will also allow greater flexibility in scheduling the various mode configurations.

Whilst this form of attitude control has many advantages it also creates a rather unique problem. For considerable lengths of time the same surfaces of the spacecraft will be facing the sun and will heat up to dangerously high temperatures. To counteract this, a series of heat pipes have been designed and fitted into the structure. These are thermal linkages of very high conductivity. They consist of closed, evacuated pipes lined with a wick material and partially filled with anhydrous ammonia. The fluid vaporises at the hot end and the vapours move through the hollow core and condense at the cold end. The fluid returns to the hot end through the wick by capillary action. The process requires no power and operates at best efficiency in zero gravity. Very clever!

The funding for P3D has been a constant struggle since its inception. A couple of times it almost had to be shelved. Despite the best efforts of the various AMSAT organisations around the world, the funds are still well short of target. Large donations have been made by various foundations but we must accept that this is an amateur radio satellite. It is up to us to fund it. We cannot expect to free-load on this one. There are many ways of contributing. Your local AMSAT co-ordinator will be pleased to pass the funds on. No doubt there will be many users once P3D is up and running. Don't be tempted to put it off until you see if it's going to meet your expectations; if everyone did that it would never get off the ground.

P3D will have more powerful transmitters than any previous OSCAR. This will allow smaller ground stations but it presents formidable design problems. The solar arrays will need to be larger and deployable since there just isn't enough surface area to have them attached to the frame. Since the available space is limited inside the launch structure, the solar panels will need to be hinged and deployed when in orbit. The array will produce about 620 watts when new and after 10 years will still produce about 350 watts. They cost about 200,000 Deutchmarks and have recently been purchased. The main battery will consist of 20 cells of 40 amp-hour capacity connected to give 22-28 VDC. There will be an auxiliary 10 amp-hour battery.

Since P3D is a secondary payload on the Ariane it must conform to whatever space is available for it to ride into orbit. It was originally hoped that the conical adaptor between the upper stage and the payloads would be large enough to house P3D, and the original design allowed for this method. Not so, unfortunately, and a hasty redesign was made necessary in which we (AMSAT) had to design and produce a cylindrical adaptor of the correct dimensions and tolerances to fit between sections of the assembly and large enough to house P3D. This structure is over 2.6 metres in diameter and had to be machined to a tolerance of 0.05 mm. (two thousandths of an inch)! Easy to see where the money goes, isn't it?

P3D will have receivers on 21, 145, 435, 1268 and 1269 MHz, and 2.4, 2.44 and 5.6 GHz. It will have transmitters on 145 and 435 MHz, 2.4, 10.4 and 24 GHz. It will have a 29 MHz transmitter which will not be part of the matrix but will be used only for broadcasting bulletins.

Components recently arrived at the Florida integration facility are the L band antenna reflectors from France, solar panels from Germany, the X band horns from Finland, the main flight battery and the X band amplifier from Germany.

Next month ...DOHOP... working "double-hop" through RS-10/11 and RS-14.

**359 Williamstown Rd, Yarraville VIC 3013*
CompuServe: 100352,3065

ar

Club Corner

South East Radio Group

1996 Mt Gambier Convention

The SERG's 32nd Mt Gambier Convention will take place on the Queen's Birthday weekend, 8 to 9 June 1996, at the usual place, the very large Mt Gambier Show Grounds Hall.

In addition to a large number of new equipment retailers, the second hand equipment stalls and the book stalls, there will be the usual fox-hunts and homebrew competition.

Drinks and meals will be available and there will be a small entry fee at the door. Accommodation will need to be booked early as Mt Gambier is very busy over this weekend. If you have any troubles, please do not hesitate to contact me.

This annual convention is one of the amateur highlights of the year. Make sure you do not miss out!

Simon Vickery VK5VST
SERG Convention Co-ordinator
PO Box 1103, Mt Gambier SA 5290
(087) 334 435

Summerland Amateur Radio Club

Computer Expo

The Summerland Amateur Radio Club will be hosting a Grand Summerland Computer Expo in the Lismore, NSW City Hall on Saturday, 25 May commencing at 9.30 am.

There will be many commercial displays of the latest in computers and electronic equipment, bring-and-buy tables for pre-loved gear, and an Internet display as well as amateur radio and packet radio demonstrations.

Admission will be $2.00, with lucky door prizes and refreshments available.

For more information, contact Rick VK2EJV on (066) 895 137, or check out the club BBS, VK2SRC-2 v VK2RPL-1 668900, or write to PO Box 524 Lismore, NSW 2480.

Rick VK2EJV

Twin Cities Radio & Electronic Club Inc

Field Day

The Twin Cities Radio & Electronic Club Inc will hold an Amateur Radio Field Day at the Murray High School (corner Kaitlers Road and Kemp Street, North Albury) on 10 to 11 August 1996.

It will commence on Saturday, 10 August around midday with tea, coffee and biscuits on arrival. A live fox-hunt will be held mid-afternoon, and a dinner is planned for Saturday evening with a guest speaker. The doors will open at 0930 hrs on the Sunday.

Items of interest will include commercial dealers stalls, second hand/swap tables, talks and demonstrations on SSTV, packet, Ausat, satellite TV and the Internet. Hot and cold food and drinks will be available.

For further information, please contact Greg Sargeant VK2EXA on (060) 211 741 (BH only!), or Fred Armstrong VK3XLV on (060) 267 350.

Greg Sargeant VK2EXA
Club President

Moorabbin & District Radio Club Inc

Moorabbin HamFest

The Moorabbin HamFest will be held this year, commencing at 10.00 am on Saturday, May 11 at the Brentwood Secondary College, Heath Street, Glen Waverley. Talk-in will be available on VK3RML repeater, or simplex on 146.500 MHz. For further details contact David Armstrong VK3KXJ on (041) 936 8740.

Novice Classes

The Moorabbin Radio Club Novice classes will commence on Wednesday, 15 May and run for a period of 12 weeks between 7.30 and 9.15 pm. For more information, or to enrol, please contact Glenn Moore VK3XXX on (03) 9865 7040 during business hours, or (03) 9531 9301 after hours.

Club Meetings

The Moorabbin & District Radio Club meets on the first and third Friday in each month, the first Friday being a natter night from 7.30 pm and the third a general meeting night commencing at 8.00 pm. Visitors are always welcome. For more information, write to the Secretary, Moorabbin & District Radio Club Inc, PO Box 58, Highett VIC 3190.

Denis Babore VK3BGS

North East Radio Club Inc

Two Metre Morse Code Beacon

The North East Radio Club's two metre Morse code beacon has shifted frequency. It is now operating under the callsign VK5VF on 145.650 MHz with an output of 10 watts from its new location on Mount Lofty.

The cycle has remained the same with 10 minute segments of random generated characters from 5 to 12 wpm, starting at 8.00 am/pm local Adelaide time at 5 wpm.

Mark Evans VK5ZHZ
Secretary, North East Radio Club
ar

Contests

*Peter Nesbit VK3APN - Federal Contest Coordinator**

Contest Calendar May - July 96

May 4/5	ARI Contest CW/SSB/RTTY	(Apr 96)
May 11/12	CQ-M Contest	(Apr 96)
May 18/19	Sangster Shield (80 m ZL)	(Apr 96)
May 25/26	CQ WPX CW Contest	(Feb 96)
Jun 1/2	RSGB Field Day CW	
Jun 8/9	ANARTS WW RTTY Contest	
Jun 8/9	South American CW DX Contest	
Jun 15	QRP Day Contest (VK)	
Jun 15/16	VK Novice Contest	
Jun 15/16	All Asia CW DX Contest	
Jun 22/23	ARRL Field Day	
Jul 1	Canada Day CW/Phone	
Jul 6	NZART Memorial Contest	
Jul 6/7	CQ WW VHF Contest	
Jul 13/14	IARU HF Championship	
Jul 20	Colombian DX Contest (Phone/CW)	
Jul 27/28	RSGB IOTA Contest	

Please note the revised date for the popular Sangster Shield contest, which is 18/19 May, not 11/12 May as shown in last month's calendar. Whilst on the subject of contest dates, my apologies to those who tuned in for the CQ-WPX contest on 23/24 March (myself included), but found that the contest didn't take place until the following weekend. Despite the most rigorous checking, this sort of thing can occasionally slip through, especially with the CQ contests which are tagged to the last weekend of the month.

Unfortunately, the WPX contest details weren't received until after our publication deadline, so the date was assumed as the fourth full weekend, whereas this year March had five full weekends!

As promised last month, this month's column contains the results of the recent Ross Hull and VHF/UHF Field Day Contests. The manager (John VK3KWA) has put a lot of thought into both contests, and outlined some aspects for possible fine tuning. If you have an interest in VHF/UHF operation, you can help by reading his comments and responding accordingly.

Finally, don't forget I still need your input regarding the proposed new 160 m contest which, incidentally, has been agreed to by NZART. The date is reasonably open, although May/June looks suitable, as QRN should be minimal, and there is a reasonable gap to the RD Contest. Any ideas, no matter how trivial they might seem, will be helpful. You can write c/o this column, or to my home address (QTHR). Assuming a May/June date is selected, the contest would not commence until next year; however, that allows a good amount of time for planning and publicity.

Many thanks this month to the following: VK2BQS, VK2SRM, VK3DID, VK3KWA, ZL1AAS, I2UIY, VE2ZP, LCRA, JARL, *CQ, Radio Communications,* and *QST.*

Until next month, good contesting!

73,
Peter VK3APN

RSGB Field Day

1500z Sat to 1500z Sun, 1/2 June

This CW contest stimulates considerable portable activity in the UK and Europe. Overseas stations can participate and submit a log, and certificates will be awarded to those in each continent who work the most portable UK stations. Send logs to: RSGB G3UFY, 77 Bensham Manor Road, Thornton Heath, Surrey CR7 7AF, England, postmarked no later than 16 days after the end of the contest

ANARTS WW DX RTTY

0000z Sat to 2400z Sun, 8/9 June

This contest is organised by the Australian National Amateur Radio Teleprinter Society, and runs on the second full weekend of June each year. The object is to contact as many stations locally and overseas as possible on 80-10 m (no WARC bands), using any digital mode (RTTY, AMTOR, FEC, PKT, PACTOR, etc – no satellite). Categories are single operator, multioperator (one Tx), and SWL. Max operating time is 30 hrs for single operators. Rest periods can be taken at any time during the contest. Mark rest periods in log.

Messages comprise RST, TIME (UTC), and CQ ZONE. For each valid QSO, points are claimed according to zone. Space precludes publishing a complete points table; however, the following extracts show the points claimable by entrants in zones 28, 29, and 30. The numbers show the number of points for QSOs with zones 1 to 40, working left to right, top to bottom (ie the first number shows the points per QSO with zone 1, 2nd with zone 2, etc):

Your Zone = 28:

31	40	40	44	45	49	53	51	55	54
49	48	46	32	30	26	22	20	20	25
20	11	14	10	15	05	07	02	10	17
31	24	34	25	36	30	22	26	19	34

Your Zone = 29:

39	50	43	52	54	47	49	54	52	44
42	37	37	42	39	36	32	30	30	34
28	21	24	20	23	16	15	10	02	09
15	32	42	33	39	31	24	24	20	44

Your Zone = 30:

35	50	35	44	46	38	40	44	45	37
41	33	34	49	47	42	38	35	32	43
37	29	30	24	30	22	18	17	09	02
24	07	51	42	47	40	33	32	29	48

Countries are as per the ARRL DXCC list, except that each call area in mainland VK, VE, JA and W counts as a separate country. Mainland VK, VE, JA and W are not claimable. Call areas outside these mainland areas (eg VK0, JD1, KL7, KC4) count as separate countries. One's own country (as defined herein) can be worked for QSO points, but not for a multiplier.

Points are determined for each band, using the relevant points table, and then added. Countries are similarly tallied. Continents are those worked on all bands (max 6). Total score is points x countries x continents. Non-VKs should add a "VK Bonus" to their points tally, which is 500 points for each VK worked on 80 m, 400 points on 40 m, 100 points on 20 m, 200 points on 15 m, and 300 points on 10 m. Send log and summary sheet to: ANARTS Contest Manager, PO Box 93, Toongabbie, NSW 2146 by 1 September of the year of the contest. If required, a full page scoring table (last revised 1994), and log and summary sheets are available from ANARTS or myself upon receipt of a SASE.

South American World Wide CW

8/9 Jun, 1200z Sat to 1800z Sunday

This contest is sponsored by the Brazilian magazine *Antenna Electronica Popular,* and occurs on each second full weekend in June. The objective is to work as many South American amateurs as possible, plus other areas. Bands are 80-10 m, and categories are single operator, single and all band; multioperator, single and all band; and QRP all band (max 10 W I/P). Exchange RST & continent (Oceania = OC). QRP stations add /QRP. Claim 10 points for each QSO with a South American station (WAC boundaries), and two points for all others. Multipliers are the total number of South American prefixes worked. Calculate the band score (band pts x band mult), and add the band scores together to get the final score. Use separate logs for each band, and send to: WWSA Contest, PO Box 282, ZIP 20001-970 Rio de Janeiro, RJ – Brazil, to arrive by 30 October 1996. A number of special prefixes will be activated during the contest, and various awards are offered.

1996 QRP Day

Saturday, 15 Jun, 0200z – 1400z

Presented by Ian Godsil, VK3DID

Sponsored by the CW Operators' QRP Club, the object is for VK, ZL and P2 amateurs to work as many stations as possible. Use CW in the normally recognised CW sections of 160-10 m (no WARC bands). The recognised QRP calling frequencies are 1815, 3530, 7030, 14060, 21060, and 28060 kHz (then QSY to a working frequency). Exchange RST + serial number starting at 001. Repeat QSOs are allowed between the same stations, on the same band, with at least three hours between subsequent QSOs.

For QSOs between VK/ZL/P2 stations, score five points for each QRP station worked, and one point for each non-QRP station worked. For QSOs between VK/ZL/P2 and those outside VK/ZL/P2, score 20 points for each QRP station worked, and 10 points for each non-QRP station worked. Additional bonuses comprise five points per 10 m QSO, 10 points per 160 m QSO, 10 points per QSO made using a home brew transmitter, and five points per QSO made using a home-brew antenna. QRP stations must not exceed 5 W carrier power to the antenna, and should sign /QRP.

Include full details of the equipment used, and send your logs to: Ron Everingham VK4EV, 30 Hunter Street, Everton Park, Queensland 4053, by 15 July 1996. Certificates will be awarded to the first three placegetters overall, and to the highest scorers in ZL and P2. Those interested in joining the CW Operators' QRP Club should write to Kevin Zeitz VK5AKZ, 41 Tobruk Ave, St Mary's, SA 5042.

Since this contest overlaps the WIA Novice Contest by six hours, contacts made during the overlap period can contribute to either or both contests, and are encouraged. The same set of serial numbers can be used for both.

1996 WIA VK Novice Contest

0800z Sat to 0800z Sun, 15/16 June

Presented by Ray Milliken, VK2SRM (Novice Contest Manager)

The object of this contest is to encourage amateur operation in Australia, New Zealand and Papua New Guinea, and particularly to promote contacts with Novice and radio club stations. Only stations in VK, ZL and P2 call areas are eligible to participate.

All operation must be confined to the Novice frequency allocations in the 10, 15 and 80 m bands, viz 3.525-3.625 MHz, 21.125-21.200 MHz and 28.100-28.600 MHz. No cross-band operation is permitted. Stations in the same call area may contact each other for contest credit.

Sections include (a) Phone-novice/full call; (b) CW-novice/full call; (c) SWL. Except for club stations, no multi-operator operation is allowed.

Phone stations call "CQ Novice Contest", and CW stations call "CQ N". Club stations should call "CQ Novice Contest, Club Station", followed by the callsign. Exchange a serial number comprising RS (or RST) followed by three figures commencing at 001 for the first contact and increasing by one for each subsequent contact.

Any station may be contacted twice per band, provided at least 12 hours has passed since the previous contact with that station. SWLs may log up to 10 sequential contacts made by a station, and then must log no less than another five stations before logging that station again. The five stations so logged need a minimum of one contact only logged.

Score five points for contacts with Novice or Intermediate stations, 10 points for contacts with club stations, and two points for contacts with full call stations. SWLs score five points for Novice to Novice contacts, two points for Novice to full call or full call to full call contacts, and 10 points for contacts made by a radio club.

Logs must show: Date/time UTC, Band, Mode, Station contacted, Report and serial number sent, Report and serial number received, Points. Each log sheet must be headed "VK Novice Contest 1996". The total claimed score for each page must be shown on the bottom of the page.

Logs must be accompanied by a summary sheet showing: callsign, name, mailing address, section entered, number of contacts, and claimed score. The summary sheet must include the following declaration: *"I hereby certify that this station was operated in accordance with the rules and spirit of the contest"*. The sheet must be signed and dated by the operator, or in the case of a club station, by a responsible officer of the committee, or a licensed operator delegated by the committee to do so.

Entrants may submit only one contest log per mode. Logs for entries where an entrant uses more than one callsign whilst operating in the contest will not be accepted. Send entries to: Novice Contest Manager, Westlakes ARC, Box 1, Teralba, NSW 2284, to arrive by Friday, 19 July 1996.

The Keith Howard VK2AKX Trophy will be awarded to the Novice entrant with the highest phone score, and the Clive Burns Memorial Trophy to the Novice entrant with the highest CW score (these are perpetual trophies on permanent display at the WIA Federal Office). In each case, the annual winner will receive a suitably inscribed wall plaque as permanent recognition. Certificates will also be awarded to the top scoring Novice station in each call area, the top scoring station in each section, and to any other entrant where meritorious operation has been carried out. Awards are at the discretion of the contest manager. A Certificate of Participation will be awarded to all operators who submit a log in the contest.

All Asian DX Contest

CW: 0000z Sat to 2400z Sun, 15/16 June
Phone: 0000z Sat to 2400z Sun, 7/8 Sept

The object is to contact as many stations in Asia as possible, on 160-10 m (no WARC bands). Classes are single operator, single and multiband; and multioperator multiband. Call "CQ AA" or "CQ Asia". Exchange RS(T) plus two figures denoting your age (YLs send "00"). For each QSO score three points on 160 m, two points on 80 m, and one point on other bands. The multiplier is the number of different Asian prefixes worked per band, according to CQ WPX rules (refer Feb 95). Example: JS9ABC/7 counts for prefix JS7. Note that JD1 stations on Ogasawara (Bonin & Volcano) Isl belong to Asia, and JD1 stations on Minamitori Shima (Marcus) Isl belong to Oceania. Final score is total QSO pts x total multiplier.

Use standard log and summary sheet format, clearly showing new multipliers when first worked. Send logs postmarked by 30 July (CW) and 30 Sept (SSB) to: JARL, AA DX Contest, Box 377, Tokyo Central, Japan. Indicate phone or CW on envelope. Awards include certificates to the top 1-5 stations in each country on each band (depending on activity), and medals to the continental leaders. For full results please enclose an IRC and SAE with log.

Asian countries are: A4 A5 A6 A7 A9 AP BV BY CR9 EP HL/HM HS HZ/7Z JA-JS JD1 (Ogasawara) JT JY OD S2 TA U/R (CIS) VR2/VS6 VU VU4 VU7 XU XV/3W XW XZ YA YI YK ZC4/5B4 1S 4S 4X/4Z 7O 8Q 9K 9M2 9N 9V.

ARRL Field Day

1800z Sat to 2100z Sun, 22/23 June

As with the RSGB Field Day (see above), overseas stations can participate and submit a log, but otherwise are ineligible to compete. Exchange RS(T)+QTH, W/VE will send operating class + ARRL/CRRL section. Send log postmarked by 26 July to: ARRL Field Day Contest, 225 Main St, Newington, CT 06111, USA.

Results of 1995 ARI DX Contest

(call/category/QSOs/mult/score)

VK2APK SO.CW 317 89 99680

Results of 1995-96 Ross Hull Contest

Presented by John Martin, VK3KWA

Activity

Activity in the 1995-96 contest was more variable than last year. Some days were quiet, but when propagation was good, large numbers of stations appeared out of the woodwork. Activity was more evenly spread around the country than in past years, with increased activity in VK6 and even a log from VK8.

Some interesting things were evident from the logs. One is the large number of stations with multi-mode capability, but which only use SSB for a few weeks over the summer. Another is the large number of new 2 m stations this year, including IC-706 owners trying out their new radios on SSB. Several of them remarked how much further they could work with SSB compared with FM, and how much more interesting it was.

The most notable contacts made during the contest were those on 10 GHz, on 13 January, from VK3XPD to VK5NC and VK5NY. Both QSOs set new state records. The other highlight was a sporadic E opening on 20 January, which resulted in many interstate 2 m contacts, and culminated in an opening to ZL.

Rules and Scoring

The calling frequency problem reared its ugly head again. The rule was toughened for the contest, which helped a lot in keeping DX calling frequencies free of local QRM. However, some people complained that the rule was now too tough, and others that it was still not tough enough! I will keep trying to solve this one, but the problem with rules is that they keep getting bigger and more complicated, just to cover the loopholes. I wish we could get rid of this calling frequency problem for all time, without the need for more rules, but guess this will never happen in practice.

There was some uncertainty about 6 m scoring, in which QSOs exceeding 1000 km deliver fewer points than those at shorter distances. Three logs had to be rescored, but this had no effect on the ranking of the major placegetters.

One entrant felt that the handicap for 6 m contacts over 1000 km is discriminatory. This is true in a sense, but the discrimination is against the band itself, not the operators! The reason is that 6 m differs from all other VHF bands. When it is open, its propagation is similar to an HF band, ie ionospheric. Without the handicap, several good dog-piles could easily produce 6 m scores far greater than anything achievable on the higher bands. If the scoring potential of sporadic E contacts was not reduced, the contest would always be won on 6 m, which would draw too much activity away from the higher bands.

Equalising Opportunities

This brings me to the broader question of how to provide more equal opportunities for as many entrants as possible. Previous rule changes along these lines included the dropping of satellite operation from the contest, and changes to 6 m scoring. More recently, the "Best 100" scoring was introduced to help entrants in less populated areas, and also those who are unable to live in the shack for weeks on end.

For several years it has been obvious that another scoring "gold mine" exists – aircraft enhancement. Use of this mode has increased greatly, and it is now possible to amass very large scores by working the same interstate stations repeatedly. This may not be a problem to stations along the eastern coastal strip, but it makes it much harder for those in less populated areas to win the contest.

Several solutions have been suggested. One is to go back to scoring based on locator squares, so there would be little to gain from making repeat contacts with the same stations. This would reduce the scoring advantage of the eastern states, but would still not guarantee the presence of an amateur station in every square that could be worked from Perth, for example. It could also kill activity, because the incentive would be to work new squares rather than to make contacts with stations in squares which had already been worked.

Another suggestion is to adopt a scoring table in which the current national distance records on each band would be worth 100 points, and the scores for other distances worked out on a pro-rata basis. This would encourage activity on higher bands, but stations in less populated areas would

still have to make some fairly stunning contacts to overcome the advantage of the eastern states.

One entrant argued that it is impossible to provide a totally flat playing field, but it could be smoothed by allowing entrants to use satellites, or 6 m without any scoring handicaps, and so on. I take the point about the playing field, but on the other hand there is a limit to the effort and expense that people should have to put into the contest!

So I would appreciate your thoughts. Are you happy with the contest as it is, or is it time to shake things up? Should there be a minor shakeup or a major upheaval?

This Year's Results

Now to the results (although some of you will have skipped my ramblings to come straight here).

We have a new winner this year. The highest score goes to Adrian Pollock, VK2FZ/4, who has made his first all-band entry in the contest this year. Adrian previously lived in Sydney and could only find space for 1296 MHz antennas; now he has moved to Queensland and grown an antenna farm. The results speak for themselves.

The runner up is Roger Steedman, VK3XRS, who set the current record of six consecutive wins. Roger has changed his place of abode and will be concentrating mainly on portable operation in the future. Congratulations to Roger on his score this year, and also his string of previous successes in the contest.

In third place is Gordon McDonald, VK2ZAB, who gained the second highest scores on 2 m and 70 cm, and a very high score also on 1296 MHz.

I hope you will all be in action again next year. With the top scores increasing steadily, competition is getting fiercer. With possible rule changes next time around, there could be even more surprises in store!

Results of 1996 VHF-UHF Field Day

Presented by John, VK3KWA

This year most entrants reported good weather, but fairly ordinary propagation. Activity was good, and the number of portable stations in the logs was surprisingly high. The number of logs was only slightly higher than last year, but of special interest is the fact that half of this year's entrants were new to the contest.

Activity

The centre of activity was again in the south-east, although there was a large increase in activity in VK4. Above 6 m, most interstate contacts were within the VK1/2/3/5/7 area. No logs were received from VK6, and no VK6 stations were worked above 6 m.

The most notable contact was a new VK4 record (still to be confirmed) for the 13 cm band, between VK4OE and VK2FZ/4. On other bands, the "notable contacts" list includes the following interstate contacts:

2 metres:
VK2BIT – VK4OE;
VK3ATL – VK1BG VK1DO VK2ZAB VK5AV VK5NC VK5AKK;
VK3BBB – VK2TWR VK5AKK VK5DK VK5LP VK5NC VK5ZMC;
VK3XLD – VK1DO VK1VP VK1BG VK5NC VK2TWR VK2XKE VK2ZRE VK7KY;
VK4IF – VK2BRG VK2ZAB VK2EJ;
VK7XR – VK3ATL VK3BBB VK3XLD VK3ER;
VK5BW – VK2EFA VK2YVG

70 cm:
VK3ATL – VK1BG VK5NC VK5DK;
VK7XR – VK3BBB VK3DEM VK3ATL

23 cm:
VK5AV – VK3KWA

Scoring

The scoring system was changed this year to encourage the use of as many bands as possible. The previous system gave an advantage to those bands where the greatest number of grid squares can be worked. Unfortunately, the changes made this year had the same effect! A possible solution seems to be to give locator squares a fixed points value, and to add the QSO and locator points rather than multiplying them. I would appreciate any comments or suggestions on this.

Several other changes are suggested for next year. The scoring difference between home and portable stations should be dropped, as it serves no purpose and just complicates the scoring. The times should be more flexible, and the requirement to start and end on the hour can be dropped.

Another change proposed for next year is to drop 6 m from the contest. Many entrants did not use 6 m; others use it but would prefer to concentrate on the higher bands. There was also a problem again with QRM from Field Day stations around 50.110 MHz; remember that DX must have priority in the 50 MHz DX window.

There should be more incentive for entrants to activate rare grid squares, and to operate from more than one grid square if they wish to. Next year all entrants will be able to claim the square they are operating from, even if they do not work any stations within that square. If a station moves to a new locator square, the three hour time limit should be "reset" and repeat contacts allowed straight away.

I would appreciate any comments or suggestions on the above – the sooner the better please. The Field Day rules have normally been published in December each year, but next time I would like to publish them no later than November.

1995-96 Ross Hull Contest Results

CALL	NAME	6m	2m	70cm	23cm	13cm	9cm	3cm	TOTAL
VK2FZ	A Pollock	460	4552	4795	4030	211	–	–	14048
VK3XRS	R Steedman	476	2986	3437	3440	156	–	–	10495
VK2ZAB	G McDonald	98	3632	4291	2370	–	–	–	10391
VK2DVZ	R Barlin	–	3444	3031	3870	–	–	–	10345
VK6KZ	W Howse	404	1728	1694	1060	377	464	1216	6943
VK5AKK	P Helbig	625	3568	2513	140	–	–	–	6846
VK5NC	T Niven	8	2124	2191	1910	–	–	336	6569
VK7XR	A Hay	510	2468	2744	500	–	–	–	6222
VK3DEM	R Ashlin	308	2180	2681	630	156	–	–	5995
VK2TWR	R Collman	288	2244	3374	–	–	–	–	5906
VK3CY	D Clarke	–	2716	3122	–	–	–	–	5838
VK3TMP	M Pickering	–	2580	2331	–	–	–	–	4911
VK3AFW	R Cook	–	2552	2163	–	–	–	–	4715
VK4KZR	R Preston	26	1524	912	550	–	–	–	3012
VK3XPD	A Devlin	–	–	–	1000	286	–	320	1606
VK6HK	D Graham	48	120	182	270	351	432	–	1403
VK7KAP	A Perkins	–	660	553	130	–	–	–	1343
VK4AR	G Ryan	399	808	126	–	–	–	–	1333
VK6BHT	N Sandford	–	308	–	–	–	–	960	1268
VK3ALZ	I Berwick	–	–	–	790	299	–	–	1089
VK3BRF	R Fincher	–	184	259	190	–	–	–	633
VK4CWJ	G Webster	400	–	–	–	–	–	–	400
VK4EJ	B McIvor	398	–	–	–	–	–	–	398
VK5LP	E Jamieson	85	140	91	20	–	–	–	336
VK3HZ/8	D Burger	22	48	28	–	–	–	–	98
VK4GWC	G Combes								Check Log
VK3DLM	L Mostert								Check Log

Results

Last year I awarded a special certificate to VK5BW for surviving the wild weather that blew his station apart. This year I make another special award, an "Iron Man Certificate". This goes to David Learmonth VK3XLD, who carried his whole station 12 km up a mountain, to his location on Mt Feathertop!

The scores show the QSO points followed by the number of locator squares worked, for each band.

Some Comments from the Logs:

VK4OE: "Much better activity in VK4 this year." VK3ER: "We all agreed that the weekend was most rewarding." VK5BW: "Poor propagation, gale force winds and 45°C temperatures forced early closure of the station." VK7XR: "Only one VK7 contact was made, the rest were from across the water."

*PO Box 2175, Caulfield Junction, VIC 3175

1996 VHF-UHF Field Day Results

CALL	LOC	6 m	2 m	70cm	23cm	13cm	TOTAL
Section A (Portable, Single Operator, 24 Hrs):							
VK3BBB	QF32	82/15	528/14	476/10	470/6	–	70020
VK3DEM	QF32	44/12	484/15	455/8	290/4	–	49647
VK4OE	QG51	19/8	228/11	245/7	280/4	13/1	24335
VK3XLD	QF33	36/7	504/18	28/1	–	–	14664
VK5XY	PF95	34/4	408/4	434/3	150/2	–	13338
VK3AFW	QF32	–	244/14	217 9	–	–	10603
VK4KZR	QG53	–	160/6	175/4	130/3	–	6045
VK3DQW	QF12	–	272/8	–	–	–	2176
VK5ZJP	PF95	–	64/3	–	–	–	192
Section B (Portable, Single Operator, 6 Hrs):							
VK3AFW	QF32	–	244/14	217/9	–	–	10603
VK4OE	QG51	9/6	112/8	98/7	130/4	13/1	9050
VK1DO	QF44	5/2	240/7	266/5	–	–	7154
VK5XY	PF95	13/4	108/4	154/3	20/1	–	3540
VK4KZR	QG53	–	60/6	63/4	70/3	–	2509
VK2BIT	QF55	–	160/15	–	–	–	2400
VK2ANK	QF45	–	112/6	28/1	–	–	980
VK3KTD	QF11	–	132/7	–	–	–	924
VK5AV	QF02	–	36/4	–	30/3	–	462
VK1PK	QF44	–	100/4	–	–	–	400
Section C (Portable, Multi Operator, 24 Hrs):							
VK3ATL[1]	QF22	136/26	652/16	609/11	460/7	–	111240
VK3ER[2]	QF11	125/23	644/11	623/9	130/3	–	70012
VK4IF[3]	QG62	117/20	492/10	588/7	260/5	–	61194
VK5BW[4]	PF96	31/7	392/10	322/6	20/1	–	18360
VK5ARC[5]	PF94	41/5	648/5	525/5	–	–	18210

([1]) Geelong Amateur Radio Club: VK3s DFL, XGD, PK, AJF, BRZ, AKK, BCL, HQ, HLS, ASQ
([2]) Eastern & Mountain District Radio Club: VK3s YNG, WWW, WT, ZJH, KCP, KAB.
([3]) Brisbane VHF Group: VK4s AR, ZMM, NEF, JSR.
([4]) VK5s BW, AJQ, ZUC.
([5]) South Coast Amateur Radio Club: VK5s UBJ, ZMC, ZWI, ZIP.

Section D (Home Station, 24 Hours):							
VK7XR	QE38	47/12	308/8	336/6	60/2	–	21208
VK3CY	QF13	–	332/18	203/7	–	–	13375
VK3TMP	QF21	–	344/13	266/7	–	–	12200
VK3KWA	QF22	17/4	144/6	168/4	270/4	–	10782
VK4EJ	QG62	48/12	92/2	105/1	–	–	3675
VK5LP	PF94	9/2	52/5	70/3	10/1	–	1551

VK QSL BUREAUX

The official list of VK QSL Bureaux. All are Inwards and Outwards unless otherwise stated.

VK1		GPO Box 600 CANBERRA ACT 2601
VK2		PO Box 73 TERALBA NSW 2284
VK3	Inwards	Box 757G, GPO MELBOURNE VIC 3001
	Outwards	40G Victory Blvd ASHBURTON VIC 3147
VK4		GPO Box 638 BRISBANE QLD 4001
VK5		PO Box 10092 Gouger St ADELAIDE SA 5001
VK6		GPO Box F319 PERTH WA 6001
VK7		GPO Box 371D HOBART TAS 7001
VK8		C/o H G Andersson VK8HA Box 619 HUMPTY DOO NT 0836
VK9/VK0		C/o Neil Penfold VK6NE 2 Moss Court KINGSLEY WA 6026

WIA News

More Intruders Appearing on 14, 18 and 21 MHz Bands

Commercial, broadcasting and military intruders can be regularly heard on the three popular DX amateur bands of 14, 18 and 21 MHz, reports the Wireless Institute's Intruder Watch Co-ordinator, Gordon Loveday VK4KAL.

In the CW section of the 20 metre band, a Western Australian amateur, VK6XW in Albany, observed a CW station in January on 14,090.2 kHz at 1000 hours UT, using a previously unrecorded call sign of DKA, bearing 345 degrees.

Two Queensland amateurs observed two frequency-shift keyed stations in January, on 14.125 kHz at 1025 UT and bearing zero degrees (due North), each using 250 Hz shift. Another Queensland amateur logged data transmissions around 0125 UT, on 14,0625 kHz and bearing 340 degrees. Frequency-shift transmissions on 14.211.5 kHz were also logged in January by amateurs in Queensland and Western Australia.

Broadcast stations have been logged on the 18 MHz band. An AM station with an Indian-accent announcer was heard on 18,075 kHz at 1123 UT, bearing 315 degrees from Perth. An FM transmission was logged on 18,120 kHz at 1142 UT, also bearing 315 degrees from Perth, along with an Indian radiotelephone link on 18,155 kHz at 0950 and 1120 UT, with the same bearing. Other broadcast signals have been heard on 18,110 kHz.

Over-the-horizon radar (OTHR) signals, believed to emanate from the RAAF in Darwin (earlier reported in WIA News, in the March issue of *Amateur Radio* magazine), were logged again in January on the 15 metre band, at 21,050 kHz from 1258 UT, and 21,223 kHz at 0530 UT. Signals were observed by amateurs from Queensland, Western Australia, and Darwin.

This intrusion has been reported to the SMA, but further log reports from radio amateurs would be welcomed.

Observation log reports, or requests for more information, should be sent to Gordon Loveday VK4KAL, Freepost Rubyvale 4702 Qld.

Divisional Notes

Forward Bias - VK1 Notes

Peter Parker VK1PK

VK1 Division Establishes Field Day Station

Members of the VK1 Division established a Field station as their contribution towards John Moyle Field Day activity. The multi-band station, operating under the VK1ACA callsign, transmitted from Dairy Farmer's Hill, just west of Canberra.

Chris VK1DO reports that the weather experienced was the worst anyone could remember on a John Moyle weekend; it was wet, windy and cold. Of the three generators used at the site, one failed, and another suffered a faulty core balance relay. Despite the flat conditions, 400 contacts were made; 170 on SSB and 230 on CW, the latter being thanks to an all-night vigil by Jim VK1FF. Despite the abovementioned poor weather, failing generators and indifferent propagation, those who attended enjoyed themselves.

News Moves to Sunday

Due to popular demand, the VK1WI News bulletin has moved from a Wednesday to a Sunday evening. The decision, which came into effect last month, was made at the 25 March General Meeting. It follows a listener survey which showed that over 80 percent of listeners preferred a Sunday evening news bulletin. The change also makes it possible for attendees at Wednesday's Novice and AOCP licence classes to hear Divisional broadcasts.

Nevertheless, there will always be some for whom a Sunday night is unsuitable. However, the VK1WI news service is amongst the most accessible in the nation, with bulletins being available on both packet radio and the Internet.

Amateurs in National Capital Rally

Nearly 20 local amateurs provided communication for the 1996 National Capital Rally, held in forests around Canberra. Hugh Blemings VK1YYZ reports that the event, held on Saturday, 2 March, was a great success, with everything going to plan. Paul VK2CJ and Leonie VK1LB were responsible for much of the organisation.

Pay TVI?

The President of the VK1 Division, Phil VK1PJ, is urging local amateurs who have had problems with nearby satellite pay TV installations to get in contact with him. Apparently there have been cases of pay TV equipment interfering with HF amateur reception, and of amateur transmissions getting into the consumer's installation. At the March Divisional meeting, our Federal Councillor Richard, VK1RJ, told members that Pay TV companies have claimed that no problems have been reported. As well, the SMA have reportedly said that this matter was not within their jurisdiction.

Potential problems involving pay TV can be in both directions; systems have been known to cause severe interference to HF reception, as well as TV reception being affected by nearby HF amateur transmitters. Members heard that it is not unknown for amateurs to be closed down because of such interference, even though their transmitting equipment was not at fault.

Phil VK1PJ can be contacted on 292 3260.

First Meeting of New Committee

The first meeting of the 1996 committee was held on Tuesday, 6 March at the home of Phil VK1PJ. As the first meeting for the new committee, many matters of interest to members were discussed. In fact, some attendees of the meeting did not get home until after midnight.

The following topics were covered:-

* Completing the administrative transition to the new committee.

* A consistent date for committee meetings – the second Monday of the month was agreed upon.

* Consideration to be given to moving the Broadcast to Sunday night;

* The need for guidance to be given to the Repeater Group on future projects.

* Alternative means of passing interstate packet radio traffic, with the closure of the VK1 Packet Wormhole.

* The desirability of holding committee meetings at a central venue, rather than at people's houses.

* The publication of a guide to Divisional services, to be made available to local amateurs.

* The WIA's Exposure Draft on Amateur Radio Licensing.

Support the advertisers who support *Amateur Radio* magazine

VI100GM QSL REMINDER

QSL Cards for the VI100GM operation in December 1995 have been printed and are ready to be sent to anyone who worked the station and is interested in a card. Certificates are also available for $5.00. Please send requests for certificates and/or QSLs to the VK1 Division Bureau, GPO Box 600.

Wormhole Closed

News has come to hand that the VK1BUD packet radio wormhole has been closed down permanently. A packet bulletin from our Secretary, John VK1ZAO, reports that the closure was due to a change in network policy by the wormhole's host. The closure means that local packet users will experience delays in sending and receiving mail from interstate.

Other means to pass packet traffic in and out of the ACT are being investigated. If you have any ideas, please send a packet to John VK1ZAO@VK1ZAO, or come along to this month's Canberra Amateur Packet Radio Group meeting.

Meetings Change

The meeting of the Canberra Amateur Packet Radio Group has now changed venue. Instead of being held on the third Tuesday of the month, at the Griffin Centre, the meeting now takes place on the fourth Thursday of the month at the Communications Laboratories, 14 Wales St, Belconnen. In addition, the Repeater Committee now meets at the same address on the second Thursday of the month. Both meetings start at 7.00 pm.

Local Experimenter Gets International Recognition

A local amateur has gained recognition in *RadCom*, the monthly publication of the Radio Society of Great Britain. In an article on computer simulations and antennas in January's issue, Pat Hawker G3VA cites experimental work done by Ralph Holland VK1BRH, whose article on antenna simulation appeared in the October 1995 issue of the WIA's *Amateur Radio* magazine. The Division congratulates Ralph on his achievement.

VK6 Notes

John R Morgan VK6NT

March General Meeting

For some time, it has been difficult to obtain a long-term Secretary for the Division. At the March General Meeting, the President took pleasure in being able to announce to the 28 members present, that

two candidates had now applied for the position, and that Council would shortly decide between them.

Following the resignation of the Bookshop Officer, the Division's stock of books is currently being held by Christine Bastin VK6ZLZ, who may be contacted via PO Box 425, Cannington WA 6107, or telephone (09) 458-6218. It is hoped that a volunteer for the post of Bookshop Officer will be discovered shortly; any volunteers?

Finally, the meeting took pleasure in acknowledging the safe return, after some months overseas, of Gwynne Brockis VK6AJG.

Reminders

This year, the General Meetings are held on the last Tuesday of each month in the Theatrette on the second floor of the Westrail Centre, East Perth, commencing at 8 pm. There is to be no meeting in December. All interested persons (members and non-members, licensed or listener) will be made welcome. Free coffee and biscuits are available at "half time".

The VK6 QSL Bureau is now a by-mail-only service, as is the case with all the other divisions. To receive their inward cards, members should send a few stamped self-addressed envelopes to: VK6 QSL Bureau, PO Box F319, Perth WA 6001. The same address is valid for out-going cards, and for the purchase of their required stickers. The latter are also on sale at the monthly meetings.

News from WARG

Seven members attended the April General Meeting of the West Australian Repeater Group, and discussed a variety of technical topics. Much time had to be devoted to designing possible measures to be taken to combat the current misuse of the East-West Link (VK6RPA), and thereby restore the efficiency with which it can transfer packet-radio data to and from VK2.

Subscriptions for 1996/7 are now due. They remain at $17, and may be paid via the Membership Secretary, PO Box 425, Cannington WA 6107. In addition to knowing that you are helping to support WARG's numerous voice repeaters, you will receive a copy of their eight-page best-yet newsletter.

WARG invites you to take part in its Perth VHF net, held every Sunday morning, commencing at 10.30 am. Listen for VK6RRG on the Lesmurdie repeater (VK6RLM, 146.750 MHz). Meetings are held at the Scout Hall on the corner of Gibbs Street and Welshpool Road, East Cannington, on the first Monday of every month, starting at about 7.30 pm. The odd-numbered months are General Meetings, and the even-numbered months are Technical Meetings.

Amateur radio – helping our community

If You Have Material ...

All material for inclusion in this column must arrive on or before the first day of the month preceding publication. Packet mail may be sent to VK6NT@VK6ZSE.#PER.#WA.AUS.OC, or write to PO Box 169, Kalamunda WA 6076, or telephone (09) 291-8275 any time.

"QRM" News from the Tasmanian Division

Robin L Harwood VK7RH

On 23 March, the Annual General Meeting of the Tasmanian Division was held at the Domain Activity Centre, otherwise known as the Old OTC Radio site. The attendance was disappointing at only 28, with apologies being received from VK7RB (ex VK7JRM) and VK7JK. A minute silence for Silent Keys, who had passed away over the past year, was observed.

After the President's Report and the Financial Report were presented, all the other reports were tabled as read. We then moved on to discussion of a Notice of Motion, to repeal and rescind the Articles of Association and replace them with those supplied in draft form, at Branch meetings and at the AGM. Although it was felt that the Articles needed replacing, there was a move to amend several clauses in the draft. However, upon legal advice, the move to amend the draft clauses was ruled out of order.

There was some discussion over the submitted draft rules and some members felt that there had been insufficient time to study the draft rules and felt they were in need of further revision. However, the motion was put and passed by 18 to 7.

The Ballot for Divisional Council, which had been counted whilst the Annual General Meeting was in progress, had a tie for the eighth position on the ballot. After legal advice, the chairman ruled that, as there had been a tie, he proposed drawing it by lots from a hat. He promptly did that, without opening the ballot. After a few minutes, the two scrutineers returned and announced there had been 95 votes cast with one informal.

The candidates declared elected are John Rogers VK7JK, Robin Harwood VK7RH, Ron Churcher VK7RN, Andrew Dixon VK7GL, Terry Ives VK7ZTI, Barry Hill VK7BE, Mike Jenner VK7FB and David Spicer VK7ZDJ. The Annual General Meeting then concluded, and the elected councillors adjourned to elect the office-bearers for 1996.

At the Council meeting that followed, Barry Hill VK7BE submitted his resignation and was thanked by council for his contribution to the Division. As there was a vacancy, it was decided to approach VK7KJC, as president of the Northern Branch, to see if he was interested in filling the casual vacancy. He has referred it to the April monthly meeting of the Branch for approval.

Ex-officio positions of the Division will be notified in next month's column.

Meetings for the month of May are: Southern Branch, Wednesday, 1 May at 2000 hrs at the Domain Activity Centre; Northern Branch, Wednesday, 8 May at 1930 hrs at St Patrick's College, Westbury Road, Prospect; Northwest Branch, Tuesday, 14 May at 1945 hrs at the Penguin High School, Ironcliff Road, Penguin.

ar

For All Your Requirements

AUTHORISED DEALER:

ICOM

KENWOOD

AMATEUR ■ COMMERCIAL
MARINE COMMUNICATIONS

Tower Communications

Shop 3, 443 Albany Highway
Victoria Park, WA 6100
Telephone (09) 470 1118
Facsimile (09) 472 3795

How's DX

*Stephen Pall VK2PS**

Sunspot Cycles

Recently, I heard two amateurs discussing missed DX opportunities, and blaming the "dreadful conditions" for their misfortune.

Conditions are only part of the problem of missed DX opportunities. The DX is there, but these days it requires a constant, almost uninterrupted, "surfing" of the bands to take advantage of the few opportunities of short, almost unexpected, openings to other parts of the world.

The sun is essentially without sunspots at the moment. The solar flux index numbers are scraping along at the bottom, with values between 68, 71 and 72 for the past two months. Low band propagation is improving slightly and many grey-line and night-time openings are there for those who have the right antennas and the stamina for staying up late or getting up very early.

The most frequently asked question in amateur circles these days is, *"When will we reach the bottom of the cycle? Does anyone know?"*

To get up-to-date information on this question, I again consulted Dr Richard Thompson, a solar scientist with the IPS Radio and Space Services in Sydney (see *How's DX?* in the May 1995 and October 1995 issues of Amateur Radio for more information on this subject). In a ten page fax to me, Dr Thompson discussed the prediction of the solar cycle, the relevant sunspot numbers and other related material.

Here is a very brief summary of his findings. *"The prediction of the solar cycle is a very interesting and important task for the solar-terrestrial forecaster. Its significance arises from the use of predictions in areas such as planning for scientific research, for satellite and spacecraft operations and for communications. The forms of predictions include the estimation of amplitude of the cycle prior to its onset; the variation of sunspot numbers within the cycle; the length of the cycle; and the timing of critical points such as maximum and minimum.*

The reappearance of reverse polarity sunspots for cycle 23, were discussed earlier (see October 1995 Amateur Radio), based on the observations made by John Kennewell, a principal scientist at the West Australian Learmonth Solar observatory. Typically, minimum does not occur until at least 12 months after the appearance of the first sunspot group of the new cycle. This sunspot group has reverse polarity. The time span between the first spots and solar minimum in the past three cycles was as follows: Cycle 20, 13 months; Cycle 21, 19 months; and Cycle 22, 16 months.

The first reverse polarity sunspots for Cycle 23 appeared on 15 May 1995, with two spots; 26 July saw the arrival of three spots; 13 August two spots again; 23 August eight spots; and September 1995 with five spots. Similar reverse polarity regions became quite common in November and December 1995, but still at very low solar latitudes.

From the data on hand the next solar minimum would be expected in mid- to late 1996.

The solar cycle is often regarded as having an 11 year period, but this is true only as an average value. Actual cycles have a period as short as nine years or as long as 14 years. Moreover, there are substantial intervals of time during which the cycle is consistently shorter than 11 years, and other intervals during which the period is consistently longer. From 1775 (Cycle 3) to 1913 (Cycle 15), the minimum period of cycle was mostly longer than 11 years. Since then solar cycles have again been shorter than 11 years.

It appears that Cycle 22 will be a little less than 10 years in length. The fundamental conclusion is that we should presently consider a duration of 10 years as normal for a cycle. A duration of 11 years, or longer, is, in fact, quite atypical.

What about the next solar Cycle 23? According to a new prediction method evolved by Dr Thompson, *"Cycle 23 will have a peak sunspot number of greater than 160 (just slightly over 200 of the 10 cm flux. VK2PS). Cycle 23 will be a large solar cycle and excludes a small or average cycle. It appears likely that Cycle 23 will exceed Cycle 21, making it the second largest cycle on record".*

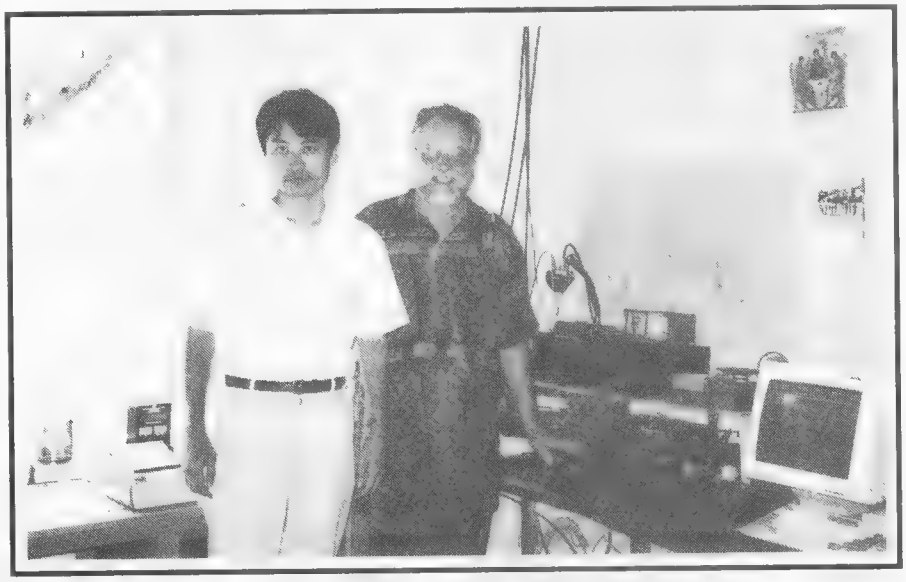
Well, that's good news. I think that with the arrival of the next millennium in a few years time, DXers around the world, even with average antennas, will have "a whale of a time" with long distance communications.

Heard Island DXpedition Update

Since reporting on this planned activity in last month's column, there have been some new developments. An Australian amateur participant has been found. David Muller of Sydney found the 40 page *"web information site"* on the Internet about Heard Island. He applied to Cordell Expeditions and was accepted as a participant. David works in the electronic industry, and is a newly licensed amateur radio operator (however, he has been mixing in amateur circles for the past fifteen years). His callsign is VK2TQM.

At present David is studying hard for his Morse examination and hopes to upgrade his callsign soon. We wish him well in the future.

Bob KK6EK, one of the Directors of the expedition, was pleased to announce the other day that the Northern California DX Foundation (NCDXF) has authorised a grant of $US20,000 to support the expedition. The team of 20 accepted operators now represents 11 DXCC countries.



Masa JE1DXC as T30XC in the shack of Father Karl T30NJ.

Myanmar – XZ

After the successful activities of the two special demonstration stations, XY1HT and XZ1Z during the second part of last year, there were high hopes of fairly regular activity from that region. Rumours were rife in January this year that OH1NYP and OH2BH would be active as XZ1A again, concentrating on 160 and 80 metres, but no activity was reported.

In February, it was said again that OH2BH and OH2KNB would travel to Myanmar to conduct further amateur radio training and would also do some operating. This planned activity had to be cancelled because regulatory issues still had to be resolved between the military and the ministries involved.

The members of the Central Arizona DX Association planned a major DXpedition to take place in Myanmar between 2 and 12 April. A CW, SSB and RTTY operation was planned with 10 operators taking part. The proposed callsign was to be XZ1N. On 15 March, Warren KF7AY, a spokesman for the group, announced that the XZ1N DXpedition had been postponed. Warren said, *"For the immediate future, the door to amateur radio in the Union of Myanmar will be closed. There have arisen a number of unsettled regulatory matters between the military and several ministries which must first be sorted out before any further amateur radio activity can proceed. It would seem that the same regulatory issues that resulted in the sudden and unexpected postponement of the XZ1R operation have led to the same action for XZ1N. Those of us who have worked closely with the members of the Myanmar government are confident that the overwhelming success of the XZ1A operation from Yangoon will be the foundation upon which future demonstration projects can be built. With the right input, one day we may even see the establishment of a new and permanent amateur radio service with licensing of Myanmar nationals. However, that day remains some distance off in the future.*

So, those of you with XZ1A cards should treasure them. It may be a while before contacts flow freely once again from the Union of Myanmar. The members of the XZ1N team remain in good spirits and are optimistic that, in the near future, we may be fortunate enough to offer this location to many of the deserving."

Broughton Island – VK2BRT

A group of Japanese amateurs resident in Australia was going to activate Broughton Island during the Easter holiday period for two days starting 6 April. The operators were Atsu VK2BEX, Chris VK2FHY and Ken VK1IAZ with the special call VK2BRT for the IOTA award. This will be a new reference number in the New South Wales State Centre Group.

Broughton Island belongs to the Myall Lake National Park and the permission of the Australian National Parks and Wildlife Service has been obtained.

The participants of the mini-expedition belong to a group called JARA, Japanese Amateur Radio in Australia. QSL to VK2BEX Atsu Asahina, PO Box 195, Killara, NSW 2071.

Marion Island – ZS8

Chris ZS5IR/ZS6RI will take part in the 53rd Marion Island expedition as a medical officer. Marion Island, part of the Prince Edward Group of islands (46° 85′ S – 37° 8′ E) became South African territory on 29 December 1947. The size of the island is 490 sq km, the highest peak is 1230 m, and it has an average rainfall of 2398 mm per year (see more details in *How's DX, Amateur Radio*, October 1994 issue).

This island has an average population of about ten people, each of whom is there on a fourteen month contract. The team usually consists of a diesel generator mechanic, three meteorologists, a radio technician and a medical officer.

The other team members are made up of research scientists who are interested in the island's wildlife of penguins, elephant seals, albatrosses and other birds, and the unique plant life. Chris will be active from the beginning of May 1996 until they leave the island in June or July 1997. He will not use the ZS8MI callsign but a special callsign of ZS8IR.

He intends to be active on all bands, 160 to 6 metres, on SSB, CW and RTTY. Antennas will be the local wire antennas (rhombics and V-beams) because of the very strong wind gusts of up to 200 km/h. QSLs go to Chris Burger ZS6EZ (ex-ZS6BCR). Chris ZS8IR will be sending logs to him every two weeks.

Melville Island – VK8MI

Stuart VK8NSB, assisted by David VK8HZ, activated this IOTA island (OC-173) for four days from 15 to 18 March 1996 using the callsign VK8MI.

Melville Island is situated due north from Darwin in the Northern Territory at a distance of about 50 km across the Clarence Strait. It is a large, generally featureless island, about 105 km long and 65 km wide, and has an area of about 5800 sq km. Considerable tides and currents are experienced around the coast and there are many hidden reefs and shoals.

The island was sighted in 1644 by Abel Tasman who took it to be part of the mainland. It was surveyed by Phillip Parker King in 1818 and named by him in honour of Viscount Melville, First Lord of the Admiralty. The aboriginal name of the island is Yermalner.

In 1824 the British Government made the first attempt to establish a settlement on the north coast of Australia and Captain J J G Bremer, who was in charge of the expedition, chose the site on Apsley Strait which he named Fort Dundas. This settlement was short-lived. Dissension, sickness, and harassment by hostile Aborigines disrupted the settlement's life during the next five years. The supply ships "Lady Nelson" and "Sedcombe" were captured by native pirates in the vicinity of Timor and burnt. The settlement, and another one at Raffles Bay, were finally abandoned in 1829 and the garrison, settlers and the remainder of stock and stores were removed to Sydney. Today, no trace remains of the Fort Dundas settlement, but the wild buffaloes, some of which still exist on Melville Island, are believed to be descended from the strays left behind there.

Stuart and David were located on the northern part of the island at the Milikapiti school in Snake Bay with the permission of the local Aboriginal elders. The four day activity resulted in approximately 1650 QSOs with 66 DXCC countries. They were active on all bands except 10 metres. The main activity was on the 15, 20 and 40 metre bands. QSL direct only to VK4AAR.

Future DX Activity

* Gunter ZK1DI moved to Papeete, French Polynesia and became active as FO0DI. He intends to go to North Cook in November and/or December. QSL to DK1RV.

* Bernhard H44MS has moved to Vanuatu and is now active as YJ0ABS.

* Gerard 5R8EN is still active in Madagascar, usually on 7057 and listening up on 7240 kHz around 1415 UTC.

* Bill Horner VK4FW (formerly VK4CRR) and his Oceania DX Group are planning to activate Cocos-Keeling Islands from 18 May to 1 June 96. Among the planned six to eight operators VK4FW, VK4DHM, VK2IVK and VK4BQL are the confirmed starters. Three complete Yaesu stations will be used for the proposed SSB and CW activity on all bands from 160 to 10 metres. Antennas will be verticals and mini beams. Preferred frequencies will be SSB: 28445, 24945, 21295, 18145, 14195, 7045 and 3799 kHz; CW: 28025, 24895, 21015, 18075, 14025, 10105, 7025, 3705 and 1825 kHz. The callsign is not known as yet. QSL to VK4FW.

* Stuart VK8NSB's next island adventure will be on Croker Island. This island is located in the Arafura Sea Coast Centre Group, north-east of the Coburg Peninsula and about 300 km flying distance from Darwin. It is planned that he will be operating for seven days from 7 to 14 August with the assistance of some full call amateurs. If full calls are present the call VK8CI will be used.

* Try to work Paul 9L1PG or Millie 9L1MG before they leave Sierra Leone on 15 May. Paul can be found working CW on 80 metres, whilst Millie cultivates the 14226 net. QSL to NW8F.

* AX2ITU will be active for 24 hours on 17 May, World Communication Day celebrating ITU Day, the 131st Anniversary of the founding of the International Telegraph Convention which in 1947 became the International Telecommunication Union (ITU). QSL via VK2PS.

* The Ukrainian Antarctic Base, Akademic Vernadskij (EMIKA) was inaugurated on 7 February 1996. There is also a Club station on the base using the call EM1U.

* Malcolm VK6LC will be active from Lacepede Island as VK6ISL from 16 to 21 May. QSL via I1HYW.

* Kermadec Island will be active from 4 to 14 May with the callsign ZL8RI. QSL via ZL2HU.

* Sam FT5WE was heard calling for contacts on 7005 between 1400 and 1700 UTC. He was also active on 30 metres. On 40 metres he only runs 100 watts to a vertical antenna, but on 80 metres he will run approx 500 watts to a dipole. QSL via F5GTW.

* DA4RG will be active on SSB from the Falkland Islands using the call VP8BPZ from May to September. QSL via GW8VHI or via the Bureau to DA4RG. QSLs will not be sent before November. (He says, "no nets, no lists.")

* W1EH is at the US Embassy in Malawi for the next three years and is active as 7Q7EH.

* Per LA7DFA plans to arrive at Jan Mayen Islands late in April and intends to be on the air by 1 May. He will stay there until October 1996. His Jan Mayen callsign is not yet known.

Interesting QSOs and QSL Information

* S21YE – Andrew – 14280 – SSB – 1321 – Feb (E). QSL via G0EHX, via the QSL Bureau.

* V51BO – Basie – 14184 – SSB – 0537 – Feb (E). QSL to the Manager, PO Box 1823, Namibia, Africa.

* TT8FT – Frank – 14255 – SSB – 0703 – Feb (E). QSL to Frank Turek, Box DL7FT, D-14004, Berlin, Germany.

* VP5EE – Ed – 14255 – SSB – 0548 – Feb (E). QSL to Edward S Ewing, Box 316, Providenciales, Turks & Caicos Island, Central Caribbean.

* R1FJZ/FJL – Eugene – 14025 – CW – 1130 – Mar (E). QSL to DF7RX (mail drop only), Bernhardt Steibl, Kehlheim Winxer Str 40, D-93309, Kehlheim, Germany.

* TD9IGI – Jerry – 7195 – SSB – 0739 – Mar (E). QSL to the Manager, PO Box 1690, Guatemala City, Guatemala, Central America.

* 9Y4GLB – Garth – 14222 – SSB – 0626 – Mar (E). QSL to Garth Bushell, 21 Belle Eau Road, Belmont, Port of Spain, Trinidad.

* 4F1UFT – Arie – 14180 – SSB – 0955 – Mar (E). QSL to PA3FWG Arie Pols, Sportlaan 27, NL-3135, GR, Vlaardingen, Netherlands.

* 9M8CC – Peter – 14260 – SSB – 1114 – Mar (E). QSL to PB0ALB Pieter F Borsboom, Coosenhoekstr 36, NL-3237 AE, Vierpoldera, Netherlands.

* 9Q5TR – Tuvio – 14243 – SSB – 0626 – Mar (E). QSL via 4Z5DP, Pia Rosher, 4 Harduf St, Ramat Efal, 52960, Israel.

* A61AM – M'hammed – 14243 – SSB – 0637 – Mar (E). QSL to KA5TQF, David C Zulawski, 2808 Catnip St, El Paso, TX 79925, USA.

* BA4AD – Davy – 14191 – SSB – 0939 – Mar (E). QSL to The Manager, PO Box 085-227, Shanghai, China.

From Here There and Everywhere

* The call DP0EPO was used by a special event station to celebrate the establishment of the European Patent Office in Munich. QSL to DF8KN.

* The private postal address of Frank YJ8AA is now PO Box 667, Port Vila, Vanuatu. The postal address of the Vanuatu Amateur Radio Society is now PO Box 665, Port Vila, Vanuatu.

* Ron VK3CN/DU5 has a new callsign – 4F5CN.

* The well known husband and wife team on Pitcairn Island, Brian Young VR6BX and Kari Young VR6KY, have moved from Pitcairn to New Zealand, in the vicinity of Auckland, to further their children's education. Kari's new call sign is ZL1DXX.

* Warren VK0WH on Macquarie Island reported that the big party of scientists who stayed at the base only during the summer, left the island on 28 March. Warren will depart now for a week long trek across the length of the island on maintenance work. During the winter, only about a dozen or so scientists are at the ANARE base, which would result in lighter workload and hopefully more leisure time for amateur radio.

QSL card of Masa JE1DXC for his activities in the Pacific during January and February 1995.

* Franz 3W6GM went home to Germany on 31 March. QSL via DF5GF.

* The planned activity by Ken AE4EL from Cocos/Keeling Island and Christmas Island was cancelled.

* 3V8AS has been reported as a pirate. Antoine F6FNU says that the TT8AK Chad station is also a pirate. The old callsign has not been re-issued.

* It was reported that Martti OH2BH and his family, Leena OH2BE and Petri OH2KNB, spent five days at the Christmas Island Casino holiday resort. During the Easter period they were active with the callsign VK9XM. The Laine family has invented a truly portable DX station which fits into an airline briefcase. Overall weight is less than 20 pounds, it can be hand-carried and it will deliver more than 1 kW output using two Motorola MRF-154s and advanced switching power supply technology. QSL via JA1BK

* According to an ARRL QSL News-release, the Pennsylvania DX Association is now the new incoming QSL Bureau for the W3 call area and QSLs should be sent to: Pennsylvania DX Association, PO Box 100, York Haven, PA 17370-0100, USA.

* DXpeditioners are exposed to all sorts of surprises, including possible physical injury. The Norwegian YL group, which planned to activate the Svalbard Islands from 31 March to 7 April as JW6RHA, JW9THA and JW8KT, intends to occupy a small cabin on the island. Unni JW6RHA said that their

biggest fear is polar bears. She said that if a bear wants to break into the cabin, it could. To make sure, she is taking along her pistol and plenty of ammunition.

* Claude F5BTW is the QSL manager for Sam FT5WE who is active on Crozet Island. Claude has now received the first batch of logs with 1000 QSOs for a period of 10 days. The direct QSLs have already been sent.

* Starting from 1 March the post codes of the Slovenian Republic have been changed. The first number of the old codes (Nr 6) has been cancelled and was replaced by the prefix SI. As an example, the old 61000 becomes SI-1000.

* If you worked 4U1SCO, it was a special event station celebrating the 50th anniversary of UNESCO. QSL to F5SNJ.

* The Italian Diamond DX Club has raised about 500 dollars to assist Malcolm VK6LC to Lacepede Island and back. Remember, it is a long journey by land and boat, and fuel costs are very expensive in the outback.

* VI3GP was a special event station celebrating the first Grand Prix in Melbourne. QSL to VK3ER.

* If you are confused with the French prefixes TM and TO, here is the solution. The TM prefix is the special prefix from France (continental stations) and the TO is the special prefix for the French overseas departments (FY, FM, FG, FS, FJ, FP, FR, FH).

* Reinaldo YV5AMH reports that the callsign 4M0I used between 16 and 20 February allegedly from Aves Island appears to be a pirate.

* Carl Ikaheimo OH6XY reports that the mail system in Bosnia-Herzegovina has started to work again, and QSL cards for the Sarajevo amateurs may be sent to PO Box 61, 71000 Sarajevo, Bosnia-Herzegovina.

QSLs Received

XZ1A (2 w – JA1BK), FH5CB (4 w op), EM2I (3 w – NA3O), 9L1PG (2 w NW8F), XT2JF (2 w N5DRV), 9U/EA1FH (2 m EA1FFC).

Thank You

Again, I must thank my many friends in the amateur radio world for their support and assistance. Special thanks go to VK2XH, VK2IAZ, VK2KFU, VK2TJF, VK2TQM, VK4FW, VK4AAR, VK5WO, VK8NSB, VK9NS, YJ8AA, ARRL DX Desk, IPS Radio & Space Services in Sydney (especially Dr R Thompson), The Australian Encyclopaedia, and the publications *QRZ DX, The DX Bulletin, The DX News Sheet, The DX News Magazine, INDEXA, 425 DX News*, and *Go List QSL Managers list.*

*PO Box 93, Dural NSW 2158
ar

Over to You – Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Catapults/Slingshots

In March of 1990 you published an article under the heading *"Field Day Catapults"*, reporting that a letter sent to the late Ken Gott VK3AJU from the Minister of Police and Emergency Services said, inter alia, *"Sections 4(j) and (k) (which relate to slingshots) do not apply to amateur radio operators"*.

This exemption, by the Governor-in-Council, was made with reference to the **Prescribed Weapons Regulations 1989** which act has subsequently been repealed. The relevant legislation is now the **Control of Weapons Act 1990.**

In view of this change, we contacted Superintendent Murray Adams, Victoria Police, the Emergency Response Officer. Through Mr Adams, we have now received advice from the Assistant Legal Adviser to the Chief Commissioner of Police, Mr Raymond Loh, and his letter concludes:

"It is my view that the exemption order of the Governor-in-Council made on 19 December 1989 is still valid and applicable under the current legislation".

So, those of our fraternity who use catapults or slingshots for the purpose of erecting antennas can continue to do so with a clear conscience.

David H Harris VK3DVW
Honorary Secretary
WICEN (Vic) Inc

Interesting Uses of Morse Code

As part of my son's education at Glenmore State Primary School, this year the Grade 6/7 BB class has learnt about the Titanic. Now, we all know about the sinking of the Titanic, but the interesting thing I saw at school was that the students learnt about **Morse Code** as part of the studies on the Titanic. Enclosed is a copy of the home work sheet entitled Morse Code. *(Space precludes reproducing the four pages here. Ed)*

To make it a little more interesting, I took along my key and keyed out the message sent by the radio operator on that fateful day. The teacher remarked at the end of the transmission, *"...it all took a long time to send..."*. I suppose my sending was at about 12 wpm, but I said that the ship's operator would have probably sent it at 30 wpm or thereabouts.

Those interested in other studies carried out at Glenmore State Primary School will find a Web page, all in the eyes of 11 and 12 year old students.

The Grade 6SR class have participated in packet radio for the last three years and will commence again in the second term this year. The packet address is via my station: VK4CNQ@VK4WIR.#CQ.QLD.AUS.OC and the WWW page is at: http://cq-pan.cqu.edu.au/schools/local-schools/gps/gps.html.

And again we see Morse being used recently by Telstra (advertising mobile phones). I don't know what they hoped to gain. A small number of the public would have deciphered it, the rest didn't worry about it.

Nick Quigley VK4CNQ
PO Box 880
Rockhampton QLD 4700

Irish Naval Service Special Event Station

The year 1996 sees the Irish Naval Service celebrating its "Golden Anniversary", 50 years of service. To highlight this special event, members of the Irish Naval Service, with help from EI7M, will operate a special event station **EI5INS** for the month of July 1996.

The event station will operate from the Irish Naval Base which is located on the Island of Haulbowline in Cork Harbour and from the EI7M Club Station at Poer Head.

To mark this memorable event, a total of seven unique QSL cards will be available. The cards will give a history of the Irish Naval Service with a different card available for each band worked. Operation will be on 160, 80, 40, 20, 15 and 10 metres, using CW and SSB, with local operation on 2 m.

Stephen Nolan EI9HC
1 Millfield Lawn
Lower Dublin Hill
Cork
Ireland
ar

Have you advised the SMA of your new address?

International Amateur Radio Union Monitoring Service (IARUMS) – Intruder Watch

*Gordon Loveday VK4KAL**

The IARU Monitoring System – Part 5

(Previous issues of *Amateur Radio* magazine contain parts 1 to 4 of this continuing series about the IARU Monitoring System.)

All modulated or keyed signals occupy a finite band width. A C60 blank cassette will get you a copy of the modes tape, which explains the method of measuring the frequencies.

Much of the information I have given in this series in *Amateur Radio* can be found in other publications. However, in the final two parts of the series I will endeavour to give the lesser known paragraphs. Most examples come from the IARUMS manual.

Signal Reporting Codes

Many signal reporting codes have been devised and discarded. It is recognised by all authorities that a quantitatively valid system of signal reporting is impractical because of the many variables present on any radio circuit. Nevertheless, an arbitrary system must be used if a listener is to convey an indication to another person of just how strong or weak the signal referred to was at any given moment at one location. For this reason, it is recommended the use of SINPO code be used.

A fuller version of the SINFEMO code for CW, etc can be supplied by the columnist.

CW Codes

The International Morse code is generally heard on the amateur bands BUT it is not the full Morse code! CW is now Mode A1A.

FSK Morse

This method for sending Morse code often introduces confusion to monitoring stations. It is difficult to receive the code when listening to both the carrier and the shifted carrier. To read correctly, simply switch in a narrow filter and listen to the shifted carrier ONLY.

RTTY (F1B) and F1 Morse

Many intruders on amateur bands use radio teletype. For "privacy" they seldom use the standard 5-bit Baudot/Murray code format. If you have RTTY equipment, try for "hard-copy". If not, log him as usual and try to establish his shift.

How? Wind up to the HF side of the signal and zero beat. Slowly tune DOWN to the low side of the signal and you will hear the second frequency creep in. The DIFFERENCE between the two frequencies is the shift of operation and the point MIDWAY between the two is the frequency of transmission.

Common intruder shifts employed are 250, 500, 1000 and 2000 Hz. The usual shift used by amateurs is 170 Hz. Amateurs can ONLY use shifts up to 850 Hz.

Be sure you are in fact monitoring a RTTY transmission. ASSTV and AMTOR are similar (refer to the modes tape).

Now we have some "odd" appearances with RTTY, REVERSALS. These are used for adjustment purposes or testing machines and appear as a series of fast dits. BLANKS are a series of dits for the mark, and a series of dahs for the space. The machine is actually idling at this stage.

RYs are a series of dits at intervals and are also used to test machines. They usually show a definite rhythm.

A rough rule of thumb is that "if the transmission continues for more than 15 minutes, the station is probably not an amateur".

Mode B9W – Phase Modulated Pulse Multi-Channel Transmission

This one can sound like R7B below, but the classical sound is that of a distant jet aero engine. Usually accompanied by two (sometimes one) guard carriers, about 3 kHz apart. If you can't hear the carriers, it could well be an R7B signal you are hearing.

Mode R7B – Amplitude-Modulated, Reduced Carrier, Multi-Channel, Voice Frequency Telegraphy

This one sounds like a big circular saw, as found in a saw mill. Average bandwidth around 7 kHz. Common on 20 metres.

Mode P0N – The Infamous "Woodpecker"

This one is self explanatory, but measure how wide the transmission is.

**Federal Intruder Watch Co-Ordinator, Freepost No 4 Rubyvale QLD 4702 or VK4KAL@VK4UN-1*

ar

SINPO Code

	S	I	N	P	O
Rate	*Signal Strength*	*Interference*	*Noise*	*Propagation Disturbance*	*Overall Rate*
5	Excellent	Nil	Nil	Nil	Excellent
4	Good	Slight	Slight	Slight	Good
3	Fair	Moderate	Moderate	Moderate	Fair
2	Poor	Severe	Severe	Severe	Poor
1	Barely Audible	Extreme	Extreme	Extreme	Unusable

Stolen Equipment

The following equipment has been reported stolen. If you have any information that may lead to the recovery of the equipment, please get in touch with the advised contact as soon as practicable.

The following equipment was stolen recently from the Dandenong West, VIC shack of Clint Jeffrey VK3CSJ. If any of this equipment is located, please contact Clint on (03) 9792 4500 AH, or (03) 9706 888 during business hours.

Yaesu Desk Mic YD-844A
Yaesu HF Transceiver FT757GX (faulty on 20 m)
Yaesu 1.2 GHz FM Transceiver FT2311R s/n 7M021315
Yaesu 2 m Handheld FM Transceiver FT290RH s/n 6G320730
Yaesu FRG7700 Receiver s/n 1H090571
Yaesu VHF Converter FRV7700
Yaesu LF Filter FF-5 s/n 1E010515 (attached to FRG7700)
Oskarblock SWR-200 Power Meter s/n 89439
Electrophone TX470 VHF CB Transceiver
NEC 9B Mobilephone
Desktop Charger for Phone
Desktop Charger NC-15 for FT290RH Handheld
Uniden HR2510 All Mode Transceiver
Trakton 6" Colour TV/Monitor CTV-400 s/n 006650
AWA Fleetmaster UHF Transceiver on 486 MHz

ar

Packet World

*Grant Willis VK5ZWI**

Introduction

Last month John VK1ZAO, in his Canberra Packet Radio Group Technical Symposium Paper, looked at the basics of how packet frames are constructed and exchanged on a typical amateur packet network.

This month we will take a look at how packet radio stations handle a particularly important part of packet radio, namely how stations determine when it is their turn to transmit. This particular facet of packet radio can have major implications on how much data can be exchanged on a particular channel and what the likelihood of successful communications will be. Consideration is also given on how the channel access aspects of packet radio scale with increasing data-rate, and the results may surprise some people.

CSMA – Carrier Sense Multiple Access

Carrier Sense Multiple Access is the mechanism which we use to determine whether or not we can transmit on the channel. After all, there is no point transmitting if there is already another station transmitting. All we will achieve is to corrupt his data and our data will also be corrupted; both stations then require retries.

The simplest form of CSMA requires that we listen to the channel, and when the channel goes free we start transmitting. Obviously if two stations are waiting for a third to finish, they will both try to transmit at the same time, thereby generating a collision.

The next level of CSMA used in amateur radio gives a small priority to those stations that are acting as digipeaters. If the packet to be sent is being digipeated, it is sent as soon as the channel goes free. All other stations that have normal packets hold them for a small time after the channel goes free before being sent. If the channel gets busy, we go back to waiting until it is free.

Currently, the most often used form of CSMA is the P-Persistence algorithm. For this we define a time called the SLOTTIME and a decision "number" PERSISTENCE. Now when the channel goes free we wait for one slottime. If the channel is still free we generate a random number and compare this to our persistence. If the number is smaller we start transmitting. If the number is larger we wait another slottime and then generate a new random number to test. If the channel goes busy, we go back to waiting until the channel is free. The philosophy here is that not all stations will try to seize the channel at the same time thus lessening the chance of a collision, but that if no other station seizes the channel, we won't wait for an inordinate length of time before commencing our transmission.

Obviously the selection of both SLOTTIME and PERSISTENCE can vastly affect the performance of a channel and it is certainly recommended that ALL users of the channel implement the same values. So I think that some discussion on the selection of these values is in order.

Slottime

This is the time that we wait after having decided not to transmit within a particular slot. If, however, another station starts transmitting within that slot, we should have waited at least long enough to detect his transmission, and probably not much longer! Therefore, slottime should equal the time that elapses between a station deciding to transmit, and another station detecting (carrier detect) that a transmission has commenced.

Transmitter Delay + Propagation Delay + Receiver Delay + TNC Delay. Note – this is the time required to detect carrier, not necessarily to detect valid data; hence transmitter delay above is not TXDELAY.

Although 100 ms is an often used default for slottime, I suspect that a better value may be in the range of 10-20 ms. I hope to do some checks to validate this assumption. Checks with two modern hand-helds showed that 100 ms is a good measure of delay from key-up to TNC carrier detect.

Persistence

This number decides our likelihood of transmitting. If set to zero we will never transmit, if set to 255 we will always immediately transmit and the algorithm degenerates to a basic CSMA. If there are likely to be two stations requiring to transmit at the same time then each should have a 50% (128) chance of seizing the channel. Similarly, if it is likely that four stations are wanting to transmit at the same time they should have a 25% chance of access. Remember that the important number here is the number of concurrent transmitting stations, not the number of packet stations in the cell.

As an example, assuming a SLOTTIME of 100 ms, and a PERSISTENCE of 25% (64), then there is a 90% chance that we will have transmitted our packet on a free channel within 8 slottimes (800 ms) and a 99% chance that we have transmitted it within 16 slottimes (1600 ms). Chance of a collision if two stations wish to transmit at the same time is 25%; the chance if three wish to transmit at the same time is 44%; and the chance if all four wish to transmit at the same time is still only 58%. That is there is still a chance that only one station will start transmitting in a slot, and that the others will detect this and delay their transmissions.

TXdelay

Although not part of CSMA, TXdelay is probably one of the other TNC parameters most likely to be set incorrectly. Again, a quick few notes on what the setting of this parameter is to obtain.

The delay here is from the time we start transmitting until the time that we start transmitting data (in the meantime we transmit only flags or some other synchronising data stream).

Transmitter delay + Propagation delay + Receiver Delay + TNC Delay.

Transmitter Delay – time for the transmitter to actually start emitting radiation after being commanded to transmit and/or the time for this transmission to be stable, whichever is longer.

Propagation Delay – time for the signal to go from transmitter to receiver, usually insignificant in VHF/UHF short path circuits, but may be significant in HF channels.

Receiver Delay – time for the receiver to unsquelch and for it to become stable. NOTE: Some handheld radios used for packet have a power save mode, which means that the radio only listens for about 125 ms out of every one or two seconds, the rest of the time it does not listen at all. If you use a handheld for packet, check that this power save mode is off.

TNC Delay – time for the TNC to synchronise to the data stream.

As the setting of these parameters can both enhance the performance gained on a single CSMA channel and also disastrously trash that performance, please check with your local packet coordination group for recommended settings for your area and select conservative settings until local recommendations can be sought. If your TNC does not support the P-Persistence algorithm please select a DIGIWAIT value equal to the time for a P-Persistence station to have a 50% chance of transmitting in your area. For the example times given above (25% persistence) this would be equal to three slottimes or 300 ms if the slottime was 100 ms.

Channel speed	300 bps	1200 bps	4800 bps	9600 bps	56k bps
eff. bit time	3.3ms	0.83ms	0.208ms	0.104ms	0.018ms
Min AX.25 frame	160 bits	160 bits	160 bits	160 bits	160 bits
Xmit time	528ms	133ms	32ms	16ms	2.9ms
Max AX.25 frame	2208 bits	2208 bits	2208 bits	2208 bits	2208 bits
Xmit time	7286ms	1832ms	459ms	230ms	39.7ms

Table 1 – Comparison of times required to transmit both the smallest possible and largest recommended AX.25 frames at different channel bit rates.

Table 1 compares the time required to transmit both the smallest possible and largest recommended AX.25 frames (256 bytes) at different channel bit rates. Obviously, in a half-duplex situation the time that the radios and TNCs require becomes a more significant part of the data throughput equation.

Conservative Recommendations for 1200 baud working are:

TXDELAY	30 (300 ms)
SLOTTIME	10 (100 ms)
PERSISTENCE	64 (maximum)
DIGIWAIT	30 (300 ms).

Other speeds should use different parameters; however, these should still be in keeping with the capabilities of the equipment being used. It is an obvious disadvantage to use the delay parameters presented for 1200 baud when using 9600 baud because the TXdelay is longer than the time taken to actually send your 9600 baud packet, reducing your efficiency to something less than 50%!

Conclusion

Next month, John VK1ZAO takes a look at how the Internet TCP/IP protocols can be applied to Amateur Packet Radio Operations.

**C/o GPO Box 1234, Adelaide SA 5001*
Packet: VK5ZWI @ VK5TTY.#ADL.#SA.AUS.OC
Internet: gwillis@dove.mtx.net.au

ar

Repeater Link

*Will McGhie VK6UU**

The FM Receiver

Listening to conversations on repeaters indicates some of us could understand more about how our FM receiver works. There are some considerable differences between FM receivers and AM or SSB receivers. It gets down to the difference between FM and other forms of modulation. It could be argued that FM is a unique form of modulation, a stand-alone, with no other modulation types having similarities.

Unique

So what is so different about FM? To put it simply, FM is not amplitude conscious. The audio level you hear out of the loud speaker is in no way proportional to the received RF signal level. To put it another way, the RF signal can be just moving the S meter, or full scale plus 60 dB; and the resulting audio level is the same.

I hear you say "but SSB and AM are the same". The audio level is the same as you drive around in your car listening to an AM radio station. The same could be said for an SSB signal, the audio varies little between an S1 and a 40 dB over S9 signal. This is not due to the nature of the modulation, but rather the design of the AM or SSB receiver.

Amplitude Modulation

It may be of value to refresh our minds on amplitude modulation, and single sideband modulation. Both are similar in the context of this discussion. The audio level out of the speaker is proportional to the RF signal level. This is a problem with amplitude type of modulation. So much so that a means of automatically changing the RF and IF gain must be built into any receiver that is designed for amplitude modulation. If this was not done, not only would the audio level change greatly from signal strength to signal strength, but at higher RF signal levels, distortion would be the result.

AGC

All amplitude modulation types of receivers must have, as part of their design, an automatic gain control that samples the RF signal level and adjusts the RF and IF gains. The result is a constant audio level out of the speaker regardless of the RF signal level.

No AGC

In contrast, FM receivers don't require AGC in the RF and IF circuits. The RF signal level has no effect on the resulting audio and very strong RF signals do not suffer from audio distortion. The modulation information is contained in the change of frequency of the RF signal and not an amplitude change.

The RF signal is amplified to a point where it is deliberately clipped, to remove any amplitude changes that may have found their way into the transmission process. Noise from power lines and car ignitions that ride in on top of the FM modulated signal are, as a result of the clipping, removed. FM suffers less from this form of interference. However, there are other factors that cause this type of interference still to be present to some degree.

Passband ripple in the IF crystal filter results in some of the pulse type noise being phase modulated. Once this noise is an FM signal, then, as an FM signal, it can not be removed by clipping.

High Gain

The RF and IF gain in an FM receiver is always flat out, as there is no AGC in an FM receiver. The overall gain in an FM receiver is higher than in an AM receiver. The RF level in the IF amplifier is amplified to a level that can be clipped. This is why, if you open the mute in an FM receiver, the noise level in the absence of a signal is so high. AM receivers don't have the same amount of gain to maintain the amplitude characteristics in any incoming signal.

The Mute

Of all the operational differences between AM type receivers and FM receivers, the mute is it. In an AM receiver there is normally no mute, for two reasons. First, AM mutes don't work very well as they have limited ability to handle pulse noise and interference. And secondly, the noise level in an AM receiver, in the absence of a signal, is low.

However, in an FM receiver the noise level coming out of the speaker is high. So high that it is very annoying. This noise, by the way, is not band noise but noise generated in the RF front end. Disconnecting the antenna from an FM receiver results in little or no change in the noise level. The noise is generated in the receiver due to the high RF and IF gain and, combined with the RF clipping, masks any band noise. A mute is essential in an FM receiver.

How it Works

How does the mute in an FM receiver work? Perhaps the most important point, is

that the mute in an FM receiver does not use the S meter signal.

The mute circuitry is not driven from the signal strength of the incoming signal. Rather, the mute looks at the signal to noise on the demodulated audio. The mute circuit measures the audio noise level and, depending on the sensitivity point that it is set to (mute pot), either allows the audio to go to the speaker amplifier or not. This is a most important point. The mute circuit looks at the signal to noise on the demodulated audio and, if the signal to noise is acceptable, allows the audio to go to the speaker amp. This point is worth repeating.

But How?

However, the mute circuit has a problem as described so far. The demodulated audio contains the wanted audio, and this appears to the mute circuit to be noise.

The mute detector is simply an amplitude detector. If the noise level is high, the mute toggles one way, and if the noise level is low, the mute circuit toggles the other way. The wanted audio on the signal is seen by the mute circuit as a changing noise level. Speech would close the mute.

The solution is to only allow the high frequency component of the demodulated audio to go to the mute circuitry. Filter out the speech, which is contained below 4 kHz, and only allow frequencies above 5 kHz to go to the mute detector circuit. It is this audio noise above 5 kHz that is used to determine if the signal to noise level is low enough to switch the speech to the speaker amplifier.

The mute pot is the control that determines the switching point of the mute circuit, and allows the audio to be switched through to the speaker amplifier. With the mute pot wound hard on, a high audio signal to noise ratio is required to switch the audio through. With the mute pot adjusted to just before the point it opens on noise alone, the mute will open on a very poor audio signal to noise ratio.

More Noise

One useful characteristic of the noise mute circuit is its immunity to being falsely triggered by varying noise such as power line noise, car ignition and lightning. The mute sees these increases in noise level as an even poorer signal to noise level, and remains closed. The result is that, with no wanted signal on the frequency you are tuned to, the mute remains closed, even when there is all sorts of unwanted noise about. Mutes for amplitude modulated systems find these types of noises difficult to handle and usually open. FM has it all over AM when it comes to providing a highly effective mute.

Mute Tail

There are so many aspects of the mute in an FM receiver, that it is difficult to know when to stop. The mute described so far is the most common, but there are more sophisticated FM mutes.

The ordinary mute is not perfect. Particularly when mobile, limitations become obvious. Weak fluttery signals cause the mute to close from time to time, reducing the intelligibility of the received signal. For this type of operation the mute should be adjusted for maximum sensitivity. This is the point where the mute just closes on no signal. Even so, fluttery signals are often cut up by the mute. One way around this is to place a delay on the mute closing. This is called the mute tail, and is the short burst of noise you hear when the incoming signal ends.

This burst of noise is even used in movies these days to show how up to date the movie makers are. Pity they also have a burst of mute noise at the start of a transmission as well.

The longer this mute tail the less weak fluttery signals are chopped up when mobile. However, if this mute tail is made too long it becomes annoying, so a compromise is required.

Hysteresis

Yet another characteristic associated with the FM mute is hysteresis. This is the difference between the open and close points of the mute, often quoted in dB. A stronger signal is required to open the mute than is required to close it.

The idea behind this characteristic is considered to be suited to commercial usage. A weak noisy signal can be difficult for the every day commercial user, so it is best not heard. However, once the mute does open on a fairly clean signal, it will remain open if the signal becomes noisy.

I don't agree with this explanation in total, but it is one explanation I have heard for using hysteresis in an FM mute. For amateur operation, hysteresis, in my opinion, is a pain. Amateur transceivers vary from having a modest amount of hysteresis, to almost none. Most commercial radios we convert to amateur bands employ hysteresis and, with most of them, the hysteresis can be modified. Hysteresis cuts up a weak signal in the mobile quite badly. Hysteresis is best avoided in amateur receivers and repeater receivers.

Proportional Mutes

One way around the weak signal performance of the mute when mobile, is to use a proportional mute circuit. This clever circuit adjusts the mute tail to be short on strong signals and proportionally longer on weaker signals.

This idea works very well but, unfortunately, is yet to find its way into amateur FM receivers. The idea is not new, but for reasons unknown, manufacturers of amateur FM transceivers have not included this idea into amateur designs.

Repeaters

This mute circuit is the logic switch in a voice repeater that turns the repeater's transmitter on and off, and is fundamentally important in the performance of the repeater. All in all, the mute circuit in an FM receiver is perhaps the most important part of the FM receiver.

CTCSS Mute

So where does the CTCSS mute fit into all this? I think there has been enough to digest for the moment, so CTCSS mutes will be covered in a future Repeater Link.

*21 Waterloo Crescent, Lesmurdie 6076
VK6UU @ VK6BBR

ar

Update

Output Balance on the Z Match

Page 10, April 1996 issue of Amateur Radio

Lloyd Butler VK5BR, author of the above article, advises that in the last sentence of the centre column on page 10, he quoted the test probe used as having a terminal resistance of several kilohms (depending on frequency).

This should have been given as several **hundred** kilohms.

Front Cover Photo, April Issue

Credit to Ron Fisher VK3OM for the photo of the Frank Hine Memorial Trophy was inadvertently omitted.

It might be a good idea to correct your copy of the April 1996 issue of *Amateur Radio* now.

ar

Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

S C (Stephen)	SCOTT	VK2FVB
J I	BREWSTER	VK2KOJ
P H (Peter)	SYME	VK5KB
R J	MCCORMICK	VK6MQ

ar

Pounding Brass

*Stephen P Smith VK2SPS**

Interested in CW and homebrewing? Why not combine the two and make a hand key. It's been some time since a project of this calibre has featured in this column. Hopefully, many home-brewers will find it both interesting and challenging. What I intend to do is present you with the parts list and base details first, and conclude with the key details in the coming months.

Firstly, my sincere thanks to Dr Jim Lycett G0MSZ who supplied the technical drawing and for his kind permission to allow me to reproduce it here for you; and to Wes VK2WES who has made two of these magnificent keys which featured in *Morsum Magnificat,* issue No 27. Wes has kindly supplied me with his own construction details which are also presented here for your benefit.

Material List

The following will be required: hacksaw, files, hammer, centre punch, soldering iron, scriber, emery paper, hand reamers, taps, bench drill (0 to 12 mm with drills to suit), centre lathe (small, 120 mm to machine all terminals, bosses, contacts, etc), and a bore trunnion for ball bearings.

While organising the above I paid many visits to the local scrap yards armed with the material list, collecting the nearest sizes of brass bits that I could. In most cases the correct size was not available so I made sure that I got oversize materials that could be machined down.

The base as specified is marble but, owing to the difficulty of accurately drilling this material, I was fortunate in being able to obtain a piece of 20 mm thick phenolic switch board panel which was perfect. Any dense wood is also satisfactory.

I added a piece of 3 mm scrap brass sheet as a cover plate and for additional weight under the base.

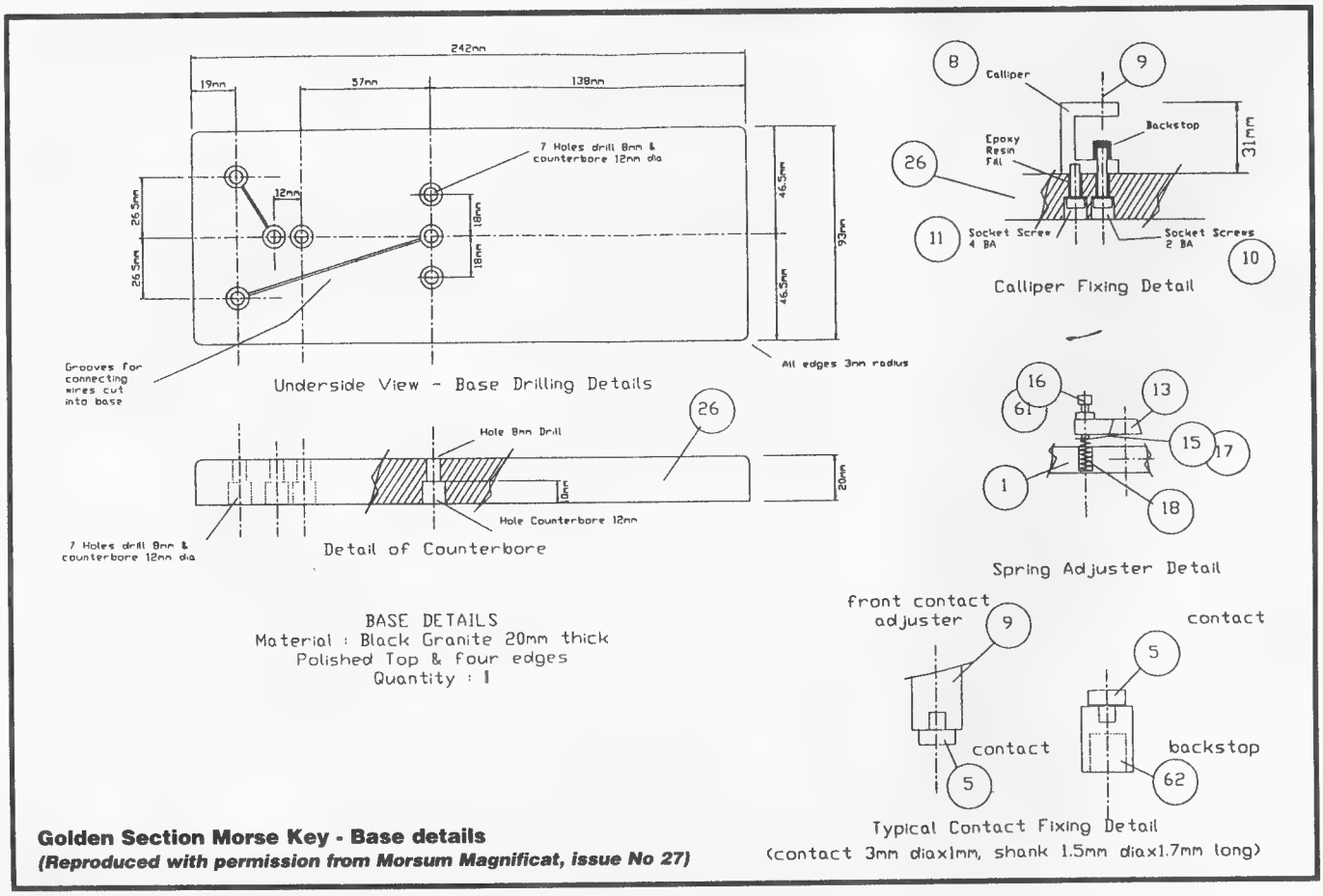
Construction Sequence

1. Terminals, adjusting screws and contacts.
2. Contact caliper.
3. Trunnion.
4. Arm.
5. Spring plate.
6. Knob and finger plate.
7. Base.
8. Assemble, adjust, test action.

The manufacturing time for two keys was approximately 50 hours. I now had a gleaming "Golden Key" and it was time to put it to a transmitter and dummy load. Adjustments were completed and I was very happy with the action and feel. Being, by this time, completely biased about its performance (equal to my beloved Swedish Key), I delivered it to a friend, who was a long time Naval and civilian professional, for evaluation. His comment, *"a lovely piece of gear."*

So there you have it. A very interesting project, the end result of which is very satisfying.

While these comments relate to the cantilever style of key as per the original drawings, they are also pertinent to a conventional arm arrangement, which has now been completed and performs flawlessly.



Golden Section Morse Key - Base details
(Reproduced with permission from Morsum Magnificat, issue No 27)

Golden Section Morse Key – Parts List

Item	Description	No	Mat	Size	Finish
001	Arm – shaped	1	brass	142x12x7	Ch Pl
002	Boss – turned	2	brass	12 diax9	Ch Pl
003	Keep plate	1	brass	16x7x2	Ch Pl
004	Contact plate	1	ph bronze	34x7x2	Ch Pl
005	Contacts	4	3 diax 1, shank 1.5 diax 1.7		
006	C/Sk socket screw	2	steel	6BAx7	Ch Pl
007	C/Sk socket screw	1	steel	6BAx5	Ch Pl
008	Calliper – shaped	1	brass	31x25x20	Ch Pl
009	Contact adjuster	1	brass	2BAx15	Ch Pl
010	Back-stop sk screw	1	steel	2BAx20	Ch Pl
011	Connector sk screw	1	brass	4BAx20	Ch Pl
012	Terminals (binding)	2	brass	2BAx16d	Ch Pl
013	Springplate-shaped	1	brass	45x28x6	Ch Pl
013a	Springplate(option)	*	brass	91x28x6	Ch Pl
014	Socket screw	2	steel	6BAx11	Ch Pl
015	Leaf spring fixing	1	brass	6BAx4	Ch Pl
016	Spring Adjuster	1	brass	4BAx12	Ch Pl
017	Leaf spring	1	Sp St	28x7x1	Ch Pl
018	Coil spring	1	Sp St	4 diax16	Ch Pl
019	Trunnion – shaped	1	brass	25Hex x25	Ch Pl
020	Socket Screw	3	steel	2BAx20	Ch Pl
021	Ball Race bearings	2	(1/2"OD x 3/16"bore x 5/32"w)		
022	Bearing Pin	1	steel	3/16"diax45	
023	Knob – turned	1	plastic	26 diax25	black
024	Studding	1	brass	2BAx18	Ch Pl
025	Finger plate	1	plastic	40diax2.5	clear
026	Base	1	granite	242x93x20	polish
027	Connecting wire	2	copper	16SWG x 200	
060	Locknut	1	brass	2BA	Ch Pl
060a	Locknut (turned & knurled to suit)			2BA	Ch Pl
061	Locknut	1	brass	4BA	Ch Pl
061a	Locknut (turned & knurled to suit)			4BA	Ch Pl
062	Back stop	1	plastic	15 diax9	black
063	Locknuts	2	brass	2BA	(terminals)
064	Washers	6	brass	2BA	
065	Washers	1	brass	4BA	

Key to abbreviations

Ch Pl = chrome plate
swg = standard wire gauge
ph bronze = phosphor bronze
OD = outside diameter,
sp st = spring steel,
BA = British Association Thread

Miscellaneous Materials

Epoxy Resin for bushing holes in base – Araldite, etc.
Bearing Cement – Locktite, superglue, etc.
Evostick for glueing felt to underside of base.
Felt – size of base.

*PO Box 361, Mona Vale NSW 2103

ar

Ionospheric Update

*Evan Jarman VK3ANI**

Solar Activity

Solar activity during the last quarter was predominantly at very low levels and continuing to decline. During the first half of February the IPS solar observatory at Culgoora saw no solar region with spots. The sunspot number at this time was 4.4.

Ionospheric Activity

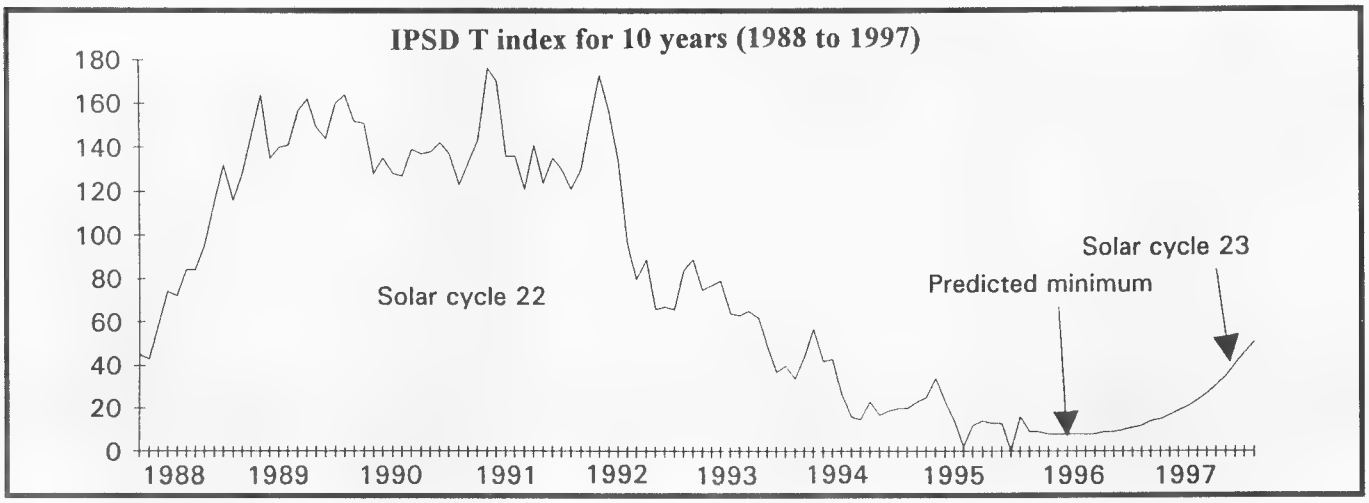
The most significant ionospheric depression occurred around the middle of January and February when values were depressed by 15-30% from the mean. The further south, the greater the depression. Blanketing sporadic E was observed from 0000 hours to 0500 hours UTC on 21 to 23 January. Strong Es (sporadic E) was reported by the Ionospheric Prediction Service throughout February especially in the southern regions of Australia.

T Index

The Ionospheric Prediction Service revised the T index values during the last quarter. Numbers from the beginning of last year up to the end of next year have been amended. A graph of the revised T index appears below. When compared with the graph in the ionospheric update last quarter (*Amateur Radio* February 1996, page 51) the changes have been minimal; just fine tuning. Because changes were made to the figures for last year does not mean that history has been rewritten. The changes are due to the delays in receiving data from some foreign ionosondes. Australian ionosonde data is obtained via the telephone network and is immediately processed. Other data is not so rapid. As the data comes in the T index is revised but the delay gives the impression that history is being rewritten; it's only an impression.

*C/o PO Box 2175, Caulfield Junction VIC 3161

ar



Spotlight on SWLing

*Robin L Harwood VK7RH**

Winter-time conditions have set in on the radio, with more daytime propagation of signals noticeable down here in the south-eastern corner of Australia. I am hearing signals directed to North, Central and South America, Europe and the Middle east between 0200 and 0600 UTC, particularly on the lower frequencies. In the evening hours, I am hearing Asian signals pretty easily but not much else. Signals from Europe are virtually non-existent while the North Americans broadcasting to the western hemisphere in their early morning are well down. All bands above 11 MHz seem to shut down after the local sunset.

Because of the unfavourable propagation conditions, I have been spending more time surfing the Internet than earwigging about the bands. Many of the major international broadcasters have opened pages on the World Wide Web or, as they are commonly referred to nowadays, websites. I have peeked in on several and have picked up quite a deal of information, which has assisted me in the hobby. Electronic mail (e-mail) is certainly a lot faster than via the conventional postal service and this faster medium has had a significant input to the various broadcasters, who find this feedback is beneficial to all concerned.

I would recommend that you obtain the latest Internet guide to International Broadcasters, prepared by Thorsten Koch in West Germany. It can be accessed at http://www.informatik.uni-oldenburg.de/~thkoch or at http://www.cs.cmu.edu/~jblythe/short-wave.html. Both sites also have links to other shortwave related websites.

It looks like I was too hasty paying my Fidonet subscription as the BBS closed mid-April. This means that I don't have a current node. I am somewhat wary of outlaying any more subscriptions as there have been feelers from several interested local "entrepreneurs" wanting to see if I would come aboard. But I think Fidonet has probably passed its use-by date as more are finding that the Internet has faster e-mail facilities than Fido plus a wider information base. The local Fido BBS did have a games area plus extensive files and shareware but, as it was only a part time effort, the sysops did not get sufficient donations to pay for its ongoing costs. The lure of the Internet now is being readily available locally through four providers, whereas 18 months previously the University had only a restricted service.

I received an e-mail at the end of March from Radio Canada International. It informed me that RCI would not be closing as scheduled at the end of March, as funding had been received for another 12 months operation. So it appears as if the public outcry that arose around Christmas time, when the shutdown was mooted, has won a reprieve for RCI.

The Carnarvon site of Radio Australia has permanently closed down. Some of the senders, I believe, will be re-located to Darwin, whilst the 100 kW units will be removed to Shepparton, or scrapped altogether. The Darwin site on the peninsula, to the east of the city, has already gone to 24 hour operation. Previously it closed in the local evening hours.

There are several American domestic broadcasters now in the enlarged medium wave allocation from 1600 to 1700 kHz. One is pretty close to New York and the other is close to San Francisco. The latter one, on 1640 kHz, does have distinct possibilities to be heard here, although it is only permitted 1 kW at night and 10 in daylight hours. The station in New Jersey is on 1660 kHz and is known as "Radio Oz". Don't be fooled by the callsign as it is the name of a children based network and has no relation to us. It, too, runs low power in the night but has been already heard in Europe.

The future of Adelaide's "Southern Cross DX Club" is in the balance. I believe that they were presented with two hefty printing bills, pretty close together and rumour is that the "DX Post" is now a bi-monthly bulletin. The question is whether it is still worth subscribing to as I am now able to download updated daily information from the Internet, rather than rely on a bi-monthly magazine, which has dated material. I have been acting as Tasmanian representative of the club but have not been officially informed and the news on what is happening came down to me via a third party who obtained it via another club.

Well that is all for May. Hope you have good propagation and monitoring.

**5 Helen Street, Newstead TAS 7250*
VK7RH@VK7BBS LTN.TAS AUS.OC
Internet: robroy@tamarcom.com.au

ar

VHF/UHF – An Expanding World

*Eric Jamieson VK5LP**

All times are UTC.

The Great Tropospheric Opening (Part 2)

Following are the contacts made during the latter half of the tropo opening across The Great Australian Bight commencing on 10/2 and continuing through to 17/2 with contacts made which, to most people, have been only a dream. That the Mount Gambier to Perth path should remain open for so long on 144, 432 and 1296 MHz seems unbelievable.

Details of the weather pattern which provided the outstanding conditions were described last month. Usually, each year during January or February, there will be a sustained opening across The Bight to Albany and/or the southern areas of VK6, but never before on the scale exhibited this time, and certainly not encompassing Perth to the degree that occurred.

However, as briefly mentioned last month, the sustained operation was confined to a rather narrow path, from Perth/Torbay/Albany to Mount Gambier and on to Portland/Melbourne/Drouin. The area north of Roger VK5NY, and this was to include Adelaide, and south to include VK5LP at Meningie, was devoid of signals, the major path being confined to a point well down in the Southern Ocean. Perth and Mount Gambier shared the greater proportion of all contacts.

Don't buy stolen equipment – check the serial number against the WIA Stolen Equipment Register first

15-2-96

0020	VK6AS	– VK6KZ/p	144	5x9	312
0025	VK6APZ	– VK6KZ/p	144	5x9	312
0049	VK5NY	– VK6KZ/p	144	5x6	1912
0115	VK5NY	– VK6KZ/p	144	cw	1912
0118	VK5NY	– VK6KZ/p	144	cw	1912
0126	VK5DK	– VK6ZWZ	144	5x6	2360
0631	VK3ZQB	– VK6KZ/p	144	5x9	2187
0705	VK5DK	– VK6KZ/p	144	5x9	2066
0754	VK5AKK	– VK6KZ/p	144	5x5	1907
0757	VK5NY	– VK6KZ/p	144	5x5	1907
0809	VK3AUU	– VK6KZ/p	144	5x5	2540
0817	VK5NY	– VK6KZ/p	432	5x1	1912
0824	VK5NY	– VK6KZ/p	1296	5x1	1912
0901	VK3DQW	– VK6KZ/p	144	5x3	2440
0910	VK3II	– VK6KZ/p	144	5x3	2440
0959	VK3AUU	– VK6KZ/p	144	5x8	2540
1000	VK5DK	– VK5LP	144	5x9	268
1011	VK5DK	– VK6KZ/p	432	5x6	2066
1030	VK3RZ	– VK6KZ/p	144	5x3	2440
1042	VK3BRZ	– VK6KZ/p	144	5x6	2340
1046	VK3ALM	– VK6KZ/p	144	5x5	2440
1500	VK5DK	– VK6KZ/p	144		2066
1600	VK5KK/p	– VK6KZ/p	144	4x1	
2025	VK3ZQB	– VK5KK/p	3cm	5x8	250
2125	VK5DK	– VK3AUU	144	5x9	458
2126	VK5DK	– VK6APZ	144	5x9	1760
2129	VK5DK	– VK6AS	144	5x9	1760
2140	VK5DK	– VK6HK	144	5x2	2360
2148	VK3AUU	– VK6AO	144		2816
2203	VK5DK	– VK3AL	144	5x7	368
2206	VK3ZQB	– VK6HK	432	3x3	2490
2207	VK6AS	– VK6HK	432	5x7	600
2210	VK3ZQB	– VK6HK	144	5x6	2490
2219	VK5DK	– VK6HK	144	5x4	2360
2223	VK3AUU	– VK6HK	144	5x3	2816
2224	VK5NY	– VK6HK	144	2x1	2180
2226	VK6AS	– VK6HK	144	5x9	600
2230	VK5NY	– VK6KZ/p	144		1912
2233	VK3AUU	– VK6KZ/p	144	5x5	2540
2244	VK6KZ/p	– VK6HK	144	5x9	400
2248	VK3II	– VK6ZWZ	144		2728
2256	VK6WG	– VK6HK	144	5x7	400
2259	VK3AUU	– VK6HK	144	5x7	2816
2301	VK6APZ	– VK6HK	144	5x6	600
2306	VK6APZ	– VK6ZWZ	432		600
2307	VK6AS	– VK6ZWZ	432		600
2308	VK3ZQB	– VK6HK	144		2490
2350	VK6WG	– VK6ZWZ	144		400
2351	VK6KZ/p	– VK6ZWZ	144		400
2357	VK6WG	– VK6ZWZ	1296		400

16/2/96

0020	VK6KZ/p	– VK6ZWZ	432	5x6	400
0021	VK6WG	– VK6ZWZ	432		400
0835	VK3ZQB	– VK6KZ/p	144		2187
1110	VK5DK	– VK6KDC	144	5x9	2251
1125	VK5DK	– VK6KDC	432	5x1	2251
1126	VK5NC	– VK6KDC	144	5x8	2254
1133	VK5DK	– VK6KZ/p	144	5x7	2066
1137	VK3AFW	– VK6WG	144	5x7	2410
1138	VK5DK	– VK6KZ/p	432	5x2	2066
1143	VK5NC	– VK6KZ/p	144	5x7	2066
1147	VK5DK	– VK6APZ	144	5x9	1760
1149	VK5NC	– VK6APZ	144	5x9	1763
1155	VK5DK	– VK6AS	144	5x9	1760
1200	VK5AV	– VK6AS	144	5x3	1760
1201	VK5AV	– VK6APZ	144	5x3	1760
1212	VK5NC	– VK6KZ/p	1296	3x1	2069
1232	VK5DK	– VK6AS	432	5x2	1760
1233	VK5DK	– VK6APZ	432	5x1	1760
1233	VK5NC	– VK6AS	432	5x2	1763
1234	VK5NC	– VK6APZ	432	5x2	1763
1245	VK5DK	– VK6KZ/p	432	5x1	2066
1303	VK5DK	– VK6KZ/p	144	5x9	2066
1305	VK5DK	– VK6KDC	144	5x9	2251
1327	VK3ZQB	– VK5DK	1296	5x9	160
1350	VK5DK	– VK5NC	1296	5x9	3.3
1415	VK5DK	– VK6AS	144	5x9	1760
1435	VK5DK	– VK6KDC	432	5x5	2251
1437	VK5DK	– VK6DM	432	5x5	1760
1438	VK5DK	– VK6AS	432	5x8	1760
1447	VK5NC	– VK6DM	144	5x2	1763
1448	VK5NC	– VK6KDC	144	5x9	2254
1452	VK5NC	– VK6KDC	432	5x6	2254
1454	VK5NC	– VK6DM	432	5x1	1763
1455	VK5DK	– VK6KRC	144	5x8	2360
1458	VK5NC	– VK6KRC	144	5x6	2363
1508	VK5DK	– VK6KAT	144	5x5	2360
1508	VK5NC	– VK6KAT	144	5x4	2363
1520	VK5NC	– VK6ZWZ	432	5x2	2363
1535	VK5DK	– VK6ZWZ	144	5x4	2360
1535	VK5NC	– VK6ZWZ	144	5x4	2363
1536	VK5NC	– VK6ZWZ	144	5x4	2363
1540	VK5DK	– VK6ZWZ	432	5x2	2360
1558	VK5DK	– VK6KRC	432	5x3	2360
1609	VK5NC	– VK6AO	144	5x6	2363
1614	VK5NC	– VK6AO	1296	5x5	2364*
1620	VK5DK	– VK6AO	432	5x6	2360
1623	VK5DK	– VK6KRC	432	5x7	2360
1634	VK5NC	– VK6AO	432	5x8	2363
2100	VK3AFW	– VK6APZ	144	5x6	2128
2105	VK5NC	– VK6KRC	144	5x9	2363
2106	VK5NC	– VK6KZ/p	144	5x9	2069
2112	VK5NC	– VK6KRC	432	5x7	2363
2123	VK5DK	– VK6AO	144	5x9	2360
2130	VK3AFW	– VK6AS	144	5x8	2128
2132	VK3AFW	– VK5DK	144	5x9	368
2133	VK5DK	– VK6SQ	144	5x7	2360
2133	VK3AFW	– VK6HK	144	5x1	2728
2135	VK5DK	– VK6KDC	144	5x7	2251
2141	VK5DK	– VK6HK	144	2x1	2360
2143	VK6APZ	– VK6HK	144	5x9	600
2147	VK3AUU	– VK6HK	144	4x2	2816
2150	VK3ZQB	– VK6HK	432	5x2	2490
2155	VK6APZ	– VK6HK	432	5x4	600
2157	VK5AV	– VK6AO	144	5x2	2360
2202	VK5DK	– VK6HK	144	5x8	2360
2220	VK3ZQB	– VK6AO	432	2490	
2223	VK5NY/p	– VK6HK	144	3x1	2260
2225	VK3ZQB	– VK6AO	1296	4x1	2490
2230	VK5NC	– VK6KZ/p	144	5x8	2069
2235	VK5AV	– VK6HK	144	4x1	2360
2240	VK3ZQB	– VK3XPD/m	1296	5x2	260*
2243	VK5AV	– VK6KRC	144	5x3	2360
2244	VK3II	– VK6HK	144	4x3	2728
2314	VK3AUU	– VK6HK	144	5x5	2816

17/2/96					
0009	VK5NC	– VK6HK	144	5x2	2363
0014	VK5NC	– VK6ZWZ	144	5x2	2363
0030	VK5NC	– VK6ZAY	144	5x1	2363
0134	VK5NC	– VK6JJ	144	5x7	2363
0135	VK5NC	– VK6KRC	144	5x7	2363
0142	VK5NC	– VK6AH	144	5x6	2363
0200	VK5NC	– VK6HK	432	419	2372*
0646	VK5NC	– VK6APZ	144	5x8	1763
0710	VK5NC	– VK5NY/p	144	5x9	100
0715	VK5AV	– VK6APZ	144	5x1	1760
0715	VK5NC	– VK5NY/p	432	5x9	100
0720	VK5NC	– VK5NY/p	1296	5x7	100
0726	VK5NC	– VK6APZ	432	5x8	1763
0902	VK5NC	– VK6KZ/p	144	5x2	2069
1027	VK5AV	– VK5LP	144	5x1	268
1034	VK5AV	– VK5NY/p	144	5x7	100
1042	VK5NC	– VK5NY/p	1296	5x9	100
1201	VK3AFW	– VK6APZ	144	5x5	2128
1225	VK3AFW	– VK6APZ	432	5x3	2128
1241	VK3AFW	– VK5NC	144	5x9	365
1654	VK5NC	– VK6ZWZ	144		2363
2141	VK5NC	– VK6AS	144	5x1	1763
2258	VK5NY/p	– VK6ZWZ	144		2260
2302	VK5EE	– VK6ZWZ	144		2360
2303	VK6AS	– VK6ZWZ	144		600
2315	VK3ZQB	– VK6ZWZ	144		2490
2359	VK5NC	– VK6ZWZ	144		2363

* These are VK5 distance records now held by VK5NC, and the 260 km contact between VK3ZQB and VK3XPD/m constitutes a new 1296 MHz mobile record. Please refer to the April issue of *Amateur Radio* for a statement from John VK3KWA on new State UHF and microwave records – they need not be repeated here.

David VK3AUU from Drouin, east of Melbourne and apparently the most easterly station to work Perth and points between, said: Stations worked were 12/2: VK6AS, VK6KZ/p; 13/2: VK6AS; 14/2: VK6s APZ, DM, ZWZ, KZ/p, AO, HK, KDC, VK5NY, VK5DK; 15/2: VK6s KZ/p, YAU, WG, APZ, AS, HK, AO, KDC, DM, VK5DK, VK7XR; 16/2: VK6s KDC, AO, KRC, AS; 17/2: VK6APZ; 18/2: VK6APZ, VK6AS.

Most of the time, signals from Adelaide were non-existent. VK6AS in Esperance was often there very early in the morning. The contact with VK6HK is a potential VK tropo record at 2816.8 km.

They can be worked!

Ron VK3AFW has been no slouch during the past three months judging by his log. Apart from multiple contacts on 144 and 432 to VK5DK, VK5NC, VK1BG, VK2TWR and 144 to VK7XR, which are not included, the following gives an idea of stations available for working from Melbourne.

Contacts on 144 MHz unless otherwise noted. 23/12/95: 2120 VK1RX, 2154 VK1DO; 30/12: 0653 VK5NC, 2114 VK1BG, 2121 VK2TWR/2, 2152 VK1DO, 2159 VK1RX, 2201 VK2FLR/p, 2253 VK5DK, 2258 VK5AV; 31/12: 2212 VK2ZAB. 1/1/96: 0402 VK5NC, 0403 VK5NC (432), 0421 VK2TWR, 0425 VK2TWR (432); 2/1: 0135 VK5DK, 0136 VK5DK (432); 3/1: 0909 VK1BG (432), 0911 VK1BG; 5/1: VK3DQW/p; 6/1: 1059 VK5AV/p, 1110 VK5PO/p.

While portable at Mount Buller for the Field Day: 13/1: 0542 VK5NC, 0546 VK5NC (432), 0647 VK7XR, 0649 VK7XR (432), 0808 VK2XKE.

Home again: 15/1: 2110 VK7XR, 2146 VK5AKK; 16/1: 0008 VK5AKK, 0011 VK5AKK (432), 1140 VK5DK (432), 1144 VK5DK, 2110 VK7XR, 2135 VK2TWR, 2137 VK2TWR (432), 2208 VK6AS; 17/1: 0917 VK1BG, 0952 VK7KAP, 0955 VK7KAP (432), 1003 VK7XR (432), 1006 VK7XR; 18/1: 2104 VK1DA, 2147 VK1VP.

20/1: Andrew VK7XR phoned Ron to alert him to the Es opening to VK4, and between 0450 and 0530 Ron worked VK4KZR, VK2FZ/4, VK4BOO, VK4APG, VK4JSR, VK4ZBH, VK4AR, VK4BKM, VK4ARN and heard VK4LP. Max VK3TMP worked eleven VK4s. Then the ZLs were noted. Charlie VK3BRZ called ZL1TWR several times without response. The same from Ron who noted that his 150 watts to a 15 element seemed insufficient for a contact! Ron also heard ZL1HI. Norm VK3DUT worked ZL1TWR, also VK3XRS and VK3DBM worked ZLs.

21/1: Open to ZL again and worked by VK3TMP, VK3KMN, VK3XRS, VK3BDM and others. VK3KMN didn't bother to write down his ZL stations as he "thought that sort of thing happened regularly on two metres SSB!"

24/1: 0640 VK2TWR; 27/1: 2239 VK5AKK; 28/1: 2129 VK5NY; 13/2: 2106 VK5AV;

14/2: 1006 VK7XR, 1028 VK7XR (432). 16/2 and 17/2 are included in the general list above, except 2151 VK2CM/p; 24/2: 2100 VK2TWR, 2104 VK1BG, 2106 VK2FZ/4 (this contact was made via a long meteor burst!), 2108 VK1BG, 2110 VK1BG (432). Ron speculates whether the contact with Rod VK2FZ/4 could have been via reflection from the space shuttle, as he is aware of two contacts made by that mode between Melbourne and Adelaide on a high power link above 400 MHz.

John Moyle Field Day

Alan VK5BW said he operated on 144 MHz from a high point at Parawa PF94 on 16/3. Conditions were not good but amongst others, he managed to work at 2039 VK3LK Heywood 5x1, 2102 VK5AKJ Mt Gambier 5x3, 2135 VK3ZGL Mildura 5x5, 2149 VK5AMD Bordertown, 2220 VK3NN Yanac 4x1. Alan said Dale VK5AFO from Mount Barker operated at Binney's Lookout, which is about 20 km to the east of me. However, I was away at the time of the contest so was not subject to strong signals from Dale!

Band Comparisons

Thanks to Neil VK6BHT and Wal VK6KZ, I have received a copy of the Propagation Summary made during the Ross Hull Contest between Neil VK6BHT at Geraldton and Wal VK6KZ at Perth, a distance of 378 km on a north-south path, drawing comparisons between 144 MHz and 10 GHz. First signal report is 144 MHz, the second 10 GHz.

30/12/95: 5x7 – 5x9; 1/1/96: 5x2 – 5x5; 2/1: 5x8 – 5x9; 3/1: 5x8 – 5x9; 4/1: 5x7 – 5x5; 5/1: 5x2 – 5x5; 6/1: 5x2 – 5x8; 7/1: 5x2 – 5x8; 8/1: 5x2 – 5x6; 9/1: 5x3 – 5x6; 10/1: 5x2 – 5x7; 11/1: nil – 5x8; 12/1: nil – 5x5; 14/1: 4x1 – 5x6; 18/1: 5x2 – 5x5; 24/1: nil – 5x5; 25/1: 5x3 – 5x8; 26/1: 5x1 – 5x6; 27/1: nil – 5x5. On 14/1 there was unusual propagation with the 10 GHz signal peaking 5 degrees to the west! On 17/1 there was a strong duct but with Wal portable at Torbay, no tests were attempted.

Summary from Neil: *Ducting was present on 22 out of 30 days or 73% of the time. I monitor Perth TV Ch 9 video carrier on 196.250 MHz with 6 KHz bandwidth receiver and dipole antenna. With no ducting present I can normally just detect the carrier, it is rare for it not to be audible.*

During ducting the level increases up to 60 dB! I can usually hear the Perth two metre beacon when Ch 9 TV is about 40 dB. However, there are occasions when there is little evidence of Ch 9 increase and yet there is a duct at sea level or a few metres ASL.

The above summary is interesting because it confirms the findings of the VK3s and VK5s, that often 10 GHz signals are stronger than two metres, which suggests that two metres is not a good indicator for 10 GHz openings! Perhaps someone, at the same time, will examine the propagation on 432 and 1296 MHz and compare these bands with 10 GHz, and report their findings to me.

New Zealand Report

Cliff ZL1MQ reports that during February, 50 MHz openings tapered off and by mid-month the band was quiet. ZL3NE worked 19 VKs and ZL2AGI had 17. On 1/3 ZL2TPY worked JA0GLM/7 and JL7IWF. During February ZL3NE and ZL2AGI between them worked 6 VK2s, 5 VK3s, 10 VK4s and 3 VK5s. Some stations were worked several times for a total of 47 contacts.

The total contacts reported for the summer with VK stations was 426 and other DX was 15, including VK9 Lord Howe Island and Norfolk Island, plus Japan. Cliff says: *We can only estimate that the number of contacts is about 70% of the total which would make the total about 600 for 1995-6. By the way – correct the beacon frequency of ZL3SIX to 50.040 MHz.*

144 MHz: This band generally opens in February between two and four times but this year remained shut, so the total number for this summer was 144, plus two to Norfolk Island. This compares well for the excellent DX season of 1985, and once again, is not the total worked.

It is interesting to note that while ZL 144 MHz contacts have been made to VK1, 2, 3, 4 and 7 this summer, VK5 seems too far away, not to mention the fate of VK6 and VK8!

UHF: During the National Field Day in December 1995, a number of Down East Microwave Transverters were used on 1296, 2424, 3456 and 5760 MHz. These transverters are obtainable from USA at a reasonable price and consist of a kitset complete with all parts. The inductance is etched in the printed circuit boards, IF 144 MHz, output a few milliwatts.

Europe

The 50 MHz report from Ted Collins G4UPS indicates he has a rather busy life, with daily scheds to SM7AED and G3CCH, usually via CW, reports on weather conditions eg cloudy, snow, sleet, hail, rain, fog, sunny, frosty, clear, dry, windy, aurora, etc, listens for beacons on 50 and 28 MHz, works a few stations on both bands, enters a report into the computer. The rest of the day is his for other tasks!

Ted's February report shows he copied ten beacons, ES6SIX, GB3BUX, GB3LER, GB3MCB, GB3NHQ, HV3SJ, SV1SIX, SV9SIX, S55ZRS, 4N1SIX. The HV3SJ beacon is new and operates from the Vatican City on 50.004.5, grid JN61fv.

On 50 MHz Ted worked CT1AUW, DJ0YS, DL2GBT, DL8EBW, DL8FCL, EH3BDT, EH3BKZ, EH3CCU, EH7KW, ES5MC, G3CCH, G3HBR, G3SKR, I0CUT, I0FHZ, IC8CQF, IK0NOJ, IK0WAC, IK2GSO, IK5RLP, IS0QDV, OEM9DMV (special event callsign), OK2DB, OZ5IQ, OZ7DX, S51TJ, S52R, S57AC, S59F, SM7AED, SP5CCC, SP9BIF, YL2DX. Some of these, particularly to Estonia, Poland, Yugoslavia and Italy, are in the range of 1600 to 2000 km so there is probably an Es component involved. There are 13 countries in the above list.

The VK Scene

Six metres appears quiet. John VK4KK phoned to say that on 24/3 at 0500 JA1 and JA9 were up to 5x9, but no JA beacons. Vladivostok TV on 49.750 was weak. Steve VK3OT has reported many video signals around 48 MHz coming from the north and north west, particularly following the sun-flare on 21/3. No other reports to hand.

Ron VK3AFW at Oakleigh, said that during the Ross Hull Contest he worked Andrew VK7XR almost every day on two metres, over the 440 km mostly water path, CW often required. (John VK3ATQ at Berwick does the same thing on six metres which is interesting, the distance about 420 km.) Other regular two metre contacts for Ron were to VK2TWR 410 km, Mount Gambier 380 km, Canberra 470 km.

From the USA

The April issue of *QST*, will carry in *The World Above 50 MHz* by Emil Pocock W3EP, considerable information in an article headed "DX Records Around the World". I hope to present some of this to readers next month.

It was interesting to read that Al Ward WB5LUA checks claimed distances with BD, the bearing and distance programs written by Michael Owen W9IP. BD is based on a refined mathematical description of the Earth's complex shape published by the US Naval Oceanographic Office in 1970, and has a claimed accuracy of a few metres, dependent upon the accuracy of determining station locations.

More on that later, but several amateurs in Australia are now using the Global Positioning System (GPS) which uses several satellites to give a readout of latitude and longitude accurate to parts of seconds, which then allows an accurate assessment of distance using appropriate computer programs.

Yesterday, 29/3, I was fortunate to have a "state visit" from Wal VK6KZ, joint holder with Roger VK5NY, of the world record on 10 GHz. Using his GPS he plotted my position on the earth's surface with a high degree of accuracy. Previously I had used the latitude and longitude of the local aerodrome, about 2 km distant, thus having a built-in error. At present, Wal is travelling around southern Australia and calculating the positions of known amateurs and their likely operating "good spots" for accurate distance plotting of future possible DX contacts on the microwave bands.

Internet Six News

The "On-line" six metre magazine for 5 March (courtesy Geoff GJ4ICD and Dave VK2KFU), contains a number of items which I must hold for the moment. However, perhaps you should know that Chris de Beer ZS8MI, will accompany the 53rd Marion Island Relief Expedition as Medical Officer, beginning May 1996 and ending June or July 1997.

Marion Island is a small (290 km) island about halfway between Cape Town and Antarctica. Chris will be QRV on all bands 160 to 6 metres on SSB, CW and RTTY, with the callsign ZS8IR, grid locator KE83WC, using an IC-735, Yaesu FL-2100Z amplifier, and an AEA PK-232 MBX multimode data controller for RTTY. Rhombics and V-beams will be used due to wind gusts to 200 km/h. QSL requests via manager, Chris R Burger ZS6EZ (ex ZS6BCR).

I mention the above because the station will be operational during our next summer, and after the ease with which we worked VK0IX in Antarctica, anything is possible. More details later if available.

Closure

A special request. Would correspondents please submit their information using UTC time. It will save me considerable time because I need to make the conversion – these columns are forwarded to several overseas destinations and those readers would be confused if I used local time.

Closing with two thoughts:

1. There are few things more consoling to men than the mere finding that other men have felt as they feel, and,

2. A bore is someone who persists in holding his own views after we have enlightened him with ours.

73 from The Voice by the Lake.

**PO Box 169, Meningie SA 5264*
Fax: (085) 751 043
Packet: VK5LP@VK5WI.#ADL.#SA.AUS.OC

HF PREDICTIONS

Evan Jarman VK3ANI

These graphs show the predicted diurnal variation in key frequencies for the nominated circuits. This also indicates the possibility of communication.

The frequencies (nominated in the legend) are:-

ALF Absorption Limiting Frequency (lower limit)

MUF Maximum Useable Frequency (50% possibility)

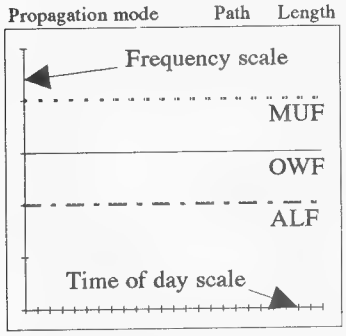
OWF Optimum Working Frequency (90% possibility)

EMUF E-layer MUF (rarely appears)

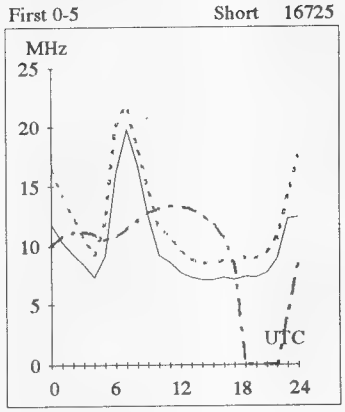
These predictions were made with one of the Ionospheric Prediction Service Stand Alone Prediction Systems. The T index used is shown above the legend. The bearing (Az) in degrees, is for the Australian station. The distance (Dist) in kilometres, is the great circle path length. The path is nominated in all cases. **ar**

T Index : 8
May-96

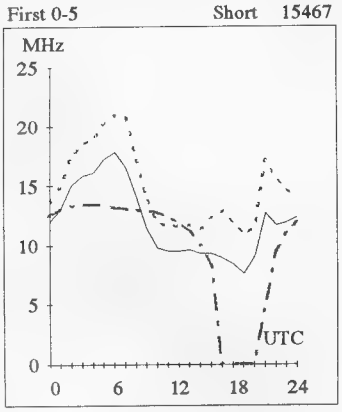
Circuit terminals Az
Propagation mode Path Length



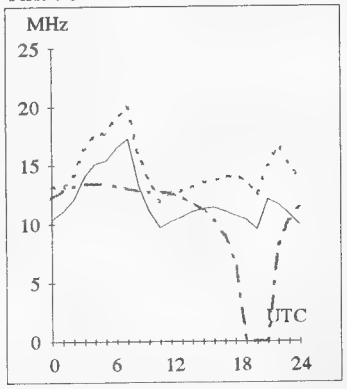
Adelaide-Dakar 233
First 0-5 Short 16725



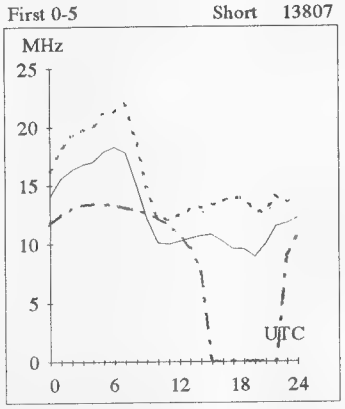
Brisbane-Budapest 312
First 0-5 Short 15467



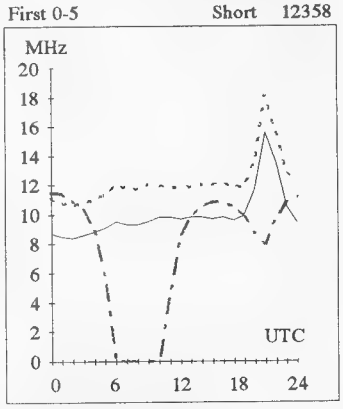
Canberra-London 316
First 0-5 Short 16982



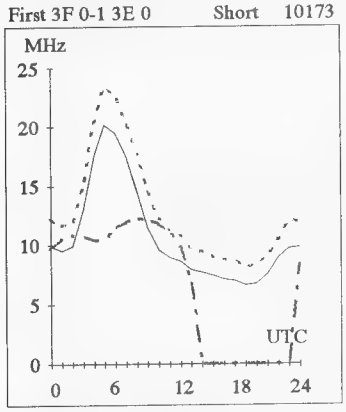
Adelaide-Moscow 318
First 0-5 Short 13807



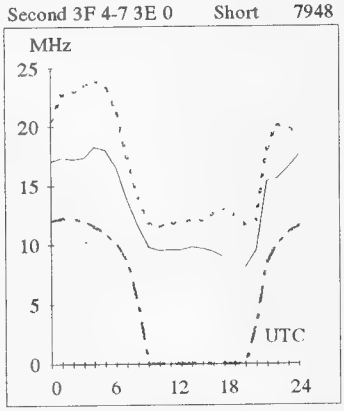
BrisbaneBuenos Aires 153
First 0-5 Short 12358



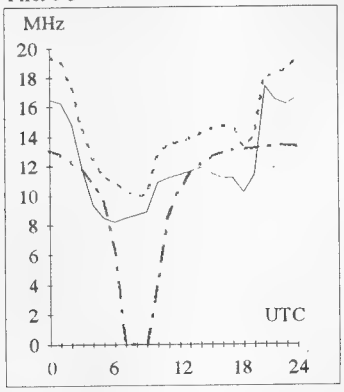
Hobart-Pretoria 232
First 3F 0-1 3E 0 Short 10173



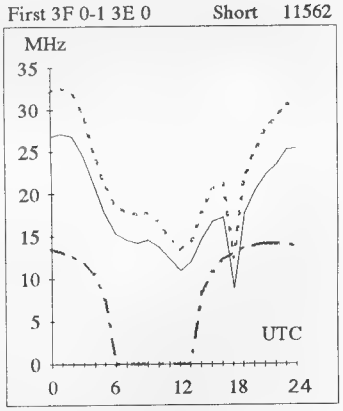
Canberra-Tokyo 352
Second 3F 4-7 3E 0 Short 7948



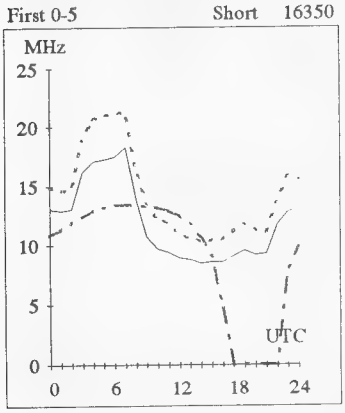
Adelaide-Ottawa 58
First 0-5 Short 16901



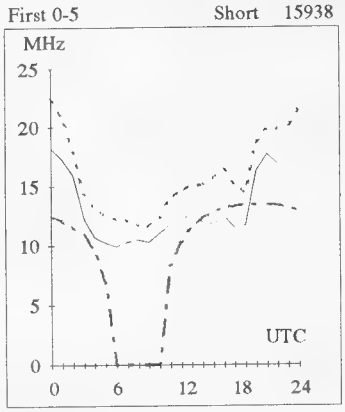
Brisbane-Los Angeles 59
First 3F 0-1 3E 0 Short 11562



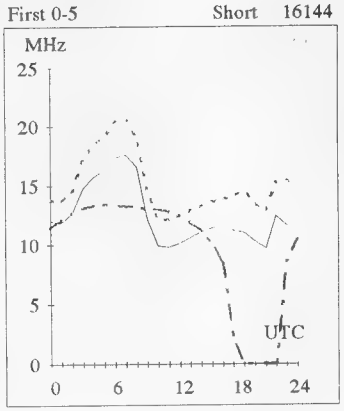
Hobart-Rome 284
First 0-5 Short 16350



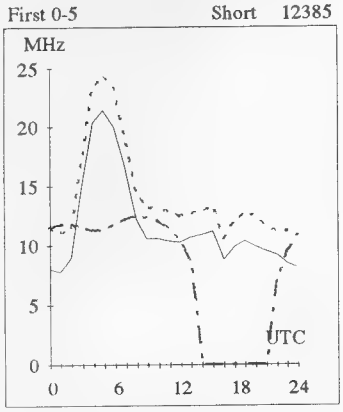
CanberraWashington 70
First 0-5 Short 15938



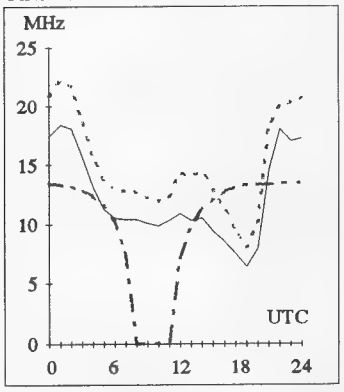
Adelaide-Paris 307
First 0-5 Short 16144



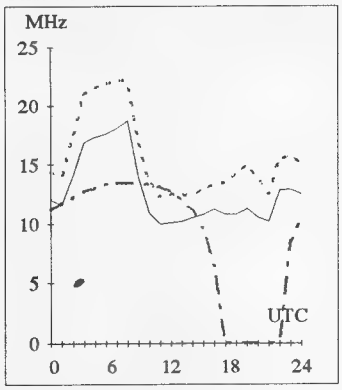
Brisbane-Lusaka 238
First 0-5 Short 12385



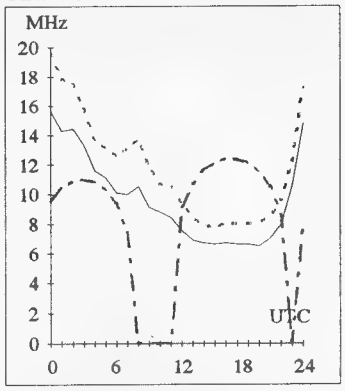
Darwin-Dallas 57
First 0-5 Short 14682



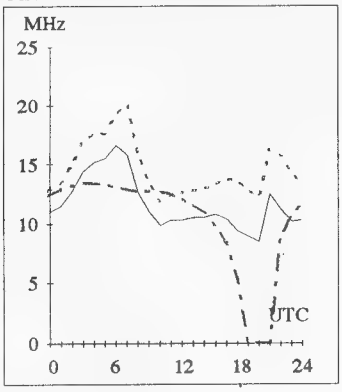
Melbourne-Athens 289
First 0-5 Short 14949



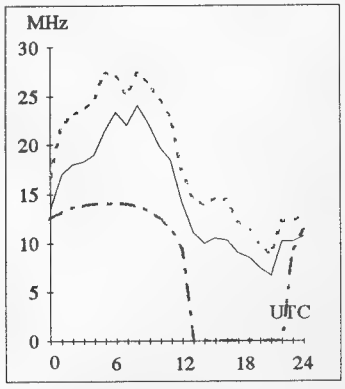
Perth-Lima 162
First 0-5 Short 14931



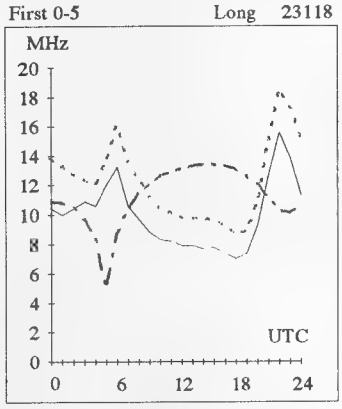
Sydney-Amsterdam 318
First 0-5 Short 16639



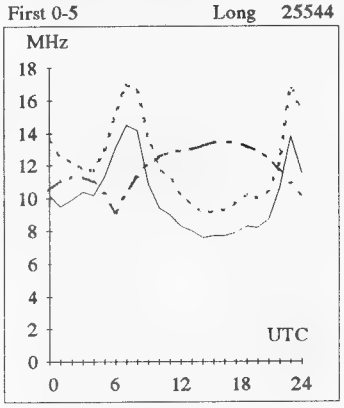
Darwin-Dubai 298
First 3F 2-6 3E 0 Short 9188



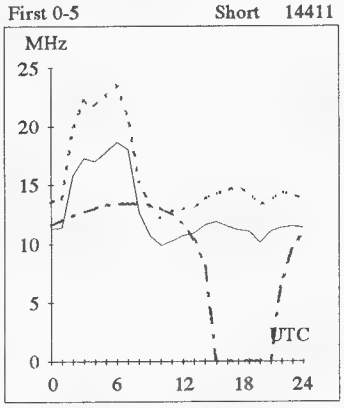
Melbourne-London 131
First 0-5 Long 23118



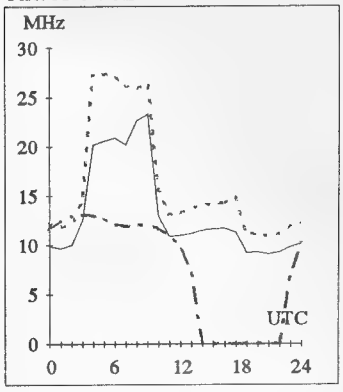
Perth-London 133
First 0-5 Long 25544



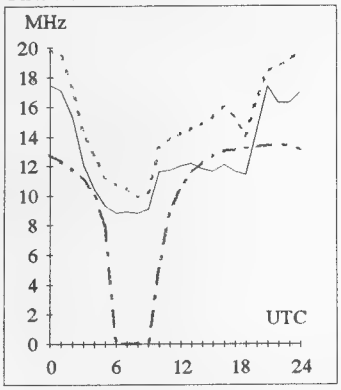
Sydney-Cairo 283
First 0-5 Short 14411



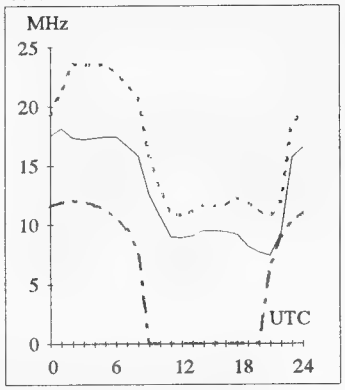
Darwin-Capetown 231
First 3F 0-0 3E 0 Short 11219



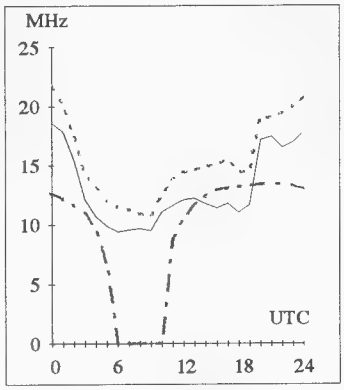
Melbourne-Montreal 62
First 0-5 Short 16733



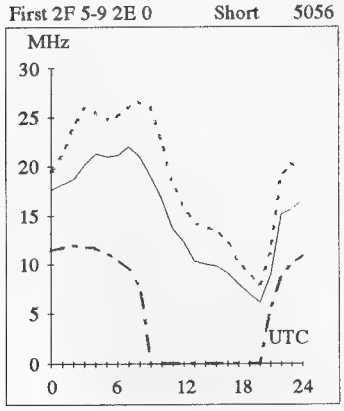
Perth-Osaka 17
Second 3F 4-8 3E 0 Short 7685



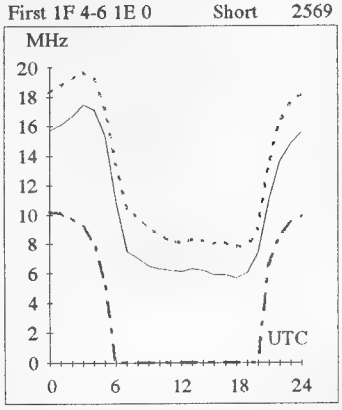
Sydney-New York 66
First 0-5 Short 15988



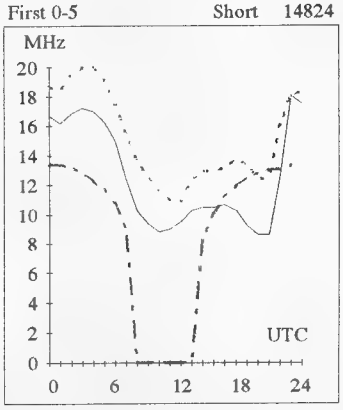
Darwin-Nagasaki 359
First 2F 5-9 2E 0 Short 5056



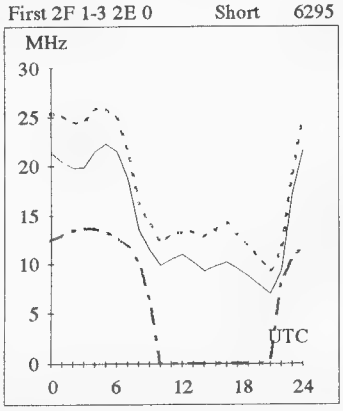
MelbourneWellington 108
First 1F 4-6 1E 0 Short 2569



Perth-Vancouver 50
First 0-5 Short 14824



Sydney-Singapore 298
First 2F 1-3 2E 0 Short 6295



HAMADS

TRADE ADS

• **AMIDON FERROMAGNETIC CORES:** For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne and Mildura: Aplha Tango Products, Perth: Haven Electronics, Nowra: and WIA Equipment Supplies, Adelaide.

• **WEATHER FAX** programs for IBM XT/ATs *** "RADFAX2" $35.00, is a high resolution shortwave weatherfax, Morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45.00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75.00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3.00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

• **HAM LOG v.3.1** - Acclaimed internationally as the best IBM logging program. Review samples....AR: "Recommend it to anyone"; The Canadian Amateur: "Beyond this reviewer's ability to do it justice. I cannot find anything to improve on. A breakthrough of computer technology". ARA: "Brilliant". Simple to use with full help, the professional HAM LOG is immensely popular (now in its 5th year), with many useful, superb features. Just $59 (+ $5 P & P), with a 90 page manual. Special five hour Internet offer. Demos, brochures available. Robin Gandevia VK2VN (02) 369 2008 BH fax (02) 369 3069.

Internet address rhg@ozemail.com.au.

• **FERRITE SLEEVED BALUN:** Excellent performance when used in G5RV, dipole or beam antennas etc. 50 ohm, 1.5 - 30 MHz. Fitted eyebolts for use as center insulator. SO239 (UHF) socket. Eliminates radiation from coax feedline. Helps reduce TVI, BCI, RFI and noise on receive. Maintains balance in antenna. **Only** $64 (+ $5 p&p). Alpha Tango Products, Box 441, Kalamunda WA 6076. Ph (09) 294 4725.

FOR SALE ACT

Yaesu FT102 good condition, YD148 mic, spare finals, handbook copy, $650 ono; **Yaesu FT747** exc condition, engraved with licence number, hand mic, AM/FM board fitted, $850. Richard VK1RJ QTHR (06) 258 1228 AH.

FOR SALE NSW

NEC 360 Spinwriter elf computer printer in excellent order, $150 negotiable. John VK2NDR QTHR (048) 71 1343.

Yaesu FT101ZD with mic and service manuals, vgc, new finals, $500 ono. Herb VK2UJ QTHR (068) 65 3213.

Shack Clearance Sat, April, please ring for date. Two element 20 m mono bander, rotator and shack controller, 3 x 3 oregon mast, cabling, purchaser to remove, G5RV, miscel gear, vintage parts. Arthur Brown VK2IK QTHR (02) 876 1465.

Kenwood TS600 6 m all mode transceiver, s/n 710099, mic, manuals, $350; **Tokyo** Hi Power 6 m 80 W linear, HL86V, s/n 819604, preamp, $175; **Kenrotor KR400** rotator control unit, cable, $200; **Telegraph key** Hi Mound BK100, $100. All in vgc. Kevin VK2BKG QTHR (049) 82250.

FOR SALE VIC

Hustler 5BTV HF trap vertical, vgc, $180; **VRK-1 radial kit** (unused), $30. Damien VK3CDI (054) 27 3121.

Antenna TH3 with balun and coax, $70; **HAM M** rotator, indicator and cable, $70. Ken VK3TL (03) 9728 5350.

Yaesu FC-757AT auto ant tuner, ex condn, $550 ono. Keith VK3BVK (052) 61 3576.

Nally crank-up tilt-over tower with engineering and all accs, best offer to $600; **Yaesu** 1.2 kW HF **Lo Pass filter,** 811A GG 600 W all **HF band linear,** $200; **Yaesu** freq counter with 200 MHz prescaler, best offer; **SWR/PWR/FS meter,** brand new, boxed, $15; **Heavy duty variable power supply** 25 A pk, 6- 24 var, $68. Don VK3ADI QTHR (03) 9859 5593.

FOR SALE QLD

Kenwood TS520S, s/n 830738, needs some repairs, spare 6146s, also **DG5 counter** (going), s/n 720321, $250. Charlie VK4BQ QTHR (077) 79 4301 or (077) 78 8786.

Yaesu FT101ZD, $450; **Yaesu FT102,** $550; **Valves** receiving, transmitting, collectable; **ARRL** handbooks, antenna handbooks, chassis punch set, $50; **Scope** iron and transformer, $40; **Meters**. Catalogue 85c stamp. P Hadgraft, 17 Paxton St, Holland Park Qld 4121 or (07) 3397 3751 AH.

Roger Davies study books and tapes including novice study guide, theory textbook, 1000 Qs and As for NAOCP, Morse tapes 1, 2, 3 and CW exams 5 wpm trial tape, never used, $30. Henry VK4CQH QTHR.

Pocom AFR-1000 Swiss made automatic RTTY-Baudot-ARQ-FEC decoder with Monacor CDM-1002 B&W 10" monitor, $500 ono; **JPS ANC-4** antenna noise canceller, $275. Hans L40370 (074) 79 4561.

FOR SALE SA

EX top of line **Kenwood TS940S** Hi Tec Sy voice frequency plus Auto ATU, condition as new, $1,000 below cost. A Shepard VK5DC (08) 31 4194.

FOR SALE TAS

Kenwood TS850SAT transceiver, **SP31** matching spkr, **PS53** power supply, as new, 4 months old. Boxes, manuals, etc, inc **Icom FL102** AM filter, suit IC760, IC765, offers, new $80. Allen VK7AN (003) 27 1171.

Never been used Sangean 45 memory shortwave receiver ATS808, $270 ono; **Matador 105** handscanner new, $100 ono; **Icom** hand held **IC-W21A**, mint cond, VHF/UHF, $380 ono. Phil VK7PU (004) 31 3020.

WANTED NSW

One 8043 Curtis chip, urgent. Dick VK2BKH QTHR (02) 9948 8082.

Help, TS950S/SD owner wishes to discuss operation of IF filter sections with owner similar rig, tnx anyone assisting. Les VK2CLB (02) 9997 1109.

Terlin mobile HF antennas with fittings, good condition only, please. Bruce VK2WWW (063) 31 1188.

Vintage electrical fittings brass, wood, procelain, bakelite, old electrical trade catalogues or brochures. Contact Brian VK2EFD (049) 77 2178 or Box 131, Cooranbong NSW 2265.

WANTED VIC

Ex-Army amplifier RF No 2, with main components and case, the Genemotor is not required. Also any crystals between 2260 kHz and 2335 kHz MC6/U style. Clem VK3CYD QTHR (051) 27 4248.

Ceramic 5-pin valve bases for QB3/300 valves (equiv 4-125), two needed for linear. Arthur VK3ENT QTHR (053) 32 8184.

Circuits, voltage tables, modification info to 6 metres for **Philips FM806.** Also need circuits etc for TCA1674 (hi-band) to modify to 2 metres. Willing to pay any copying costs. Glenn VK3FFX (03) 9531 9301.

WANTED QLD

Garrard 401 turntable, cash or swap Ham gear. John VK4TL (070) 96 8328.

Heathkit 6 m amplifier, Heathkit 2 m all-mode transceiver, Heathkit SB200 amplifier, Heathkit VHF SWR-power meter, Heathkit HF SWR-power meter, Heathkit rotary coax switch, Heathkit HW16, HW101, DX40, DX60 transmitters/transceiver for operational Heathkit Museum. Contact "Doc" VK4CMY PO Box 24, Dalveen Qld 4374 or phone (076) 85 2167 before 8 pm please. Vietnam Veterans Wireless Group.

HV filter capacitors for plate and screen supplies, must be reasonably priced. Ron VK4BL QTHR (070) 55 0230.

Linear Amp suitable for use with Yaesu FT101ZD Tx. John Kaarsberg VK4GY (076) 34 5485.

MISCELLANEOUS

• THE WIA QSL Collection (now Federal) requires QSLs. All types welcome especially rare DX pictorial cards special issue. Please contact Hon. Curator Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350.

• VK6HC (QTHR) is looking for ex-RAAF signals ops, particularly D/F operators who served in VK6 during WWII. Historical research. Phone (09) 293 2658. **ar**

Editor's Comment

Continued from page 2

In Indonesia, during the Sukarno era from 1945, amateur radio was prohibited; but it is now flourishing since Suharto became president in 1967. American amateurs are surprised to be told that Australian amateurs are still not permitted to discuss a wide range of topics (eg politics, religion, business). The American telephone system has always been privately owned.

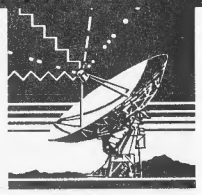
Australian CB operators (who outnumber amateurs by 20 to 1) may talk about virtually anything and can, in particular, use their equipment for commercial purposes. Yet, unlike amateurs, they do not now need licences, they pass no examinations and they pay no licence fees. They are well and truly deregulated!

Some deregulation has appeared on the amateur scene. The WIA (not the government) now administers the licence exams. It is possible the WIA may take over the issue of amateur call-signs. The licence regulations now promulgated by the Spectrum Management Agency are much more streamlined and liberal than the old PMG regulations of past decades.

Why is all this happening? Because government administration costs money. In many cases it costs more than the revenue it collects; so obviously there is merit in deregulating, particularly if a competent private body or society is waiting to take over the job. We are, with increasing speed, being carried into a deregulated future!

Bill Rice VK3ABP
Editor
ar

NEW FROM KRIEGER



THE HISTORY OF RADIO ASTRONOMY AND THE NATIONAL RADIO ASTRONOMY OBSERVATORY:
Evolution Toward Big Science
by Benjamin K. Malphrus
Orig. Ed. 1996 210 pp.
ISBN 0-89464-841-1 $49.50

RADIO AMATEURS GUIDE TO THE IONOSPHERE
by Leo F. McNamara
Orig. Ed. 1994 176 pp.
ISBN 0-89464-804-7 Paper $39.50

These and Other Titles Can be Obtained From:
DA Information Systems
648 Whitehorse Road
Mitcham, Victoria 3132
AUSTRALIA
Phone: 61 3 9210 7777
Fax : 61 3 9210 7788

KRIEGER
PUBLISHING COMPANY

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details: eg Name, Address, Telephone Number (and STD code), on both form. Please print copy for your Hamad as clearly as possible.
* Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non-members. Please enclose a mailing label from this magazine with your Hamad.
* Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
* Copy typed or in block letters to PO Box 2175, Caulfield Junction, Vic 3161, by the deadlines as indicated on page 1 of each issue.
* QTHR means address is correct as set out in the WIA current Call Book.
* WIA policy recommends that Hamads include the serial numb,er of all equipment offered for sale.
* Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.

Ordinary Hamads submitted from members who are deemed to be in general electronics, retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.
Conditions for commercial advertising are as follows: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge – $25.00 pre-payable.

State: . . . . . .

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name: . . . . . Call Sign: . . . . . Address: . . . . . .

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

	Division Address	Officers			Weekly News Broadcasts		1996 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601	President Secretary Treasurer	Philip Rayner John Woolner Bernie Copier	VK1PJ VK1ZAO VK1KOX	3.570 MHz LSB, 146.900 MHz FM each Sunday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet aus.radio.amateur.misc newsgroup, and on the VK1 Home Page http://email.nla.gov.au/~cmakin/wiaact.html	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta 2124 Phone (02) 689 2417 Freecall 1800 817 644 Fax (02) 633 1525	President Secretary Treasurer (Office hours Web:http://sydney.dialix.ozau/~wiansw e-mail address: wiansw@sydney.dialix.oz.au	Michael Corbin Eric Fossey Eric Van De Weyer Mon-Sat 11.00-14.00 Mon 1900-2100)	VK2YC VK2EFY VK2KUR	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (* morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2 m, 70 cm, 23 cm. The broadcast text is available on the Internet newsgroup *aus.radio.amateur.misc*, and on packet radio.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 9885 9261 Fax (03) 9885 9298	President Secretary Treasurer (Office hours Tue & Thur 0830-1530)	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3NC	VK3BWI broadcasts on the 1st and 3rd Sunday of the month, starts 10.30 am. Primary frequencies 1.840 AM, 3.615 LSB, 7.085 LSB, and FM(R)s 146.700 Mt Dandenong, 147.250 Mt Macedon, 147.225 Mt Baw Baw, and 2 m FM(R)s VK3RMA, VK3RSH and VK3ROW. 70 cm FM(R)s VK3ROU and VK3RGL. Major news under call VK3WI on Victorian packet BBS.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (074) 96 4714	President Secretary Treasurer	Geoff Sanders John Stevens John Presotto	VK4KEL VK4AFS VK4WX	1.825 MHz SSB, 3.605 MHz SSB, 7.118 MHz SSB, 14.342 MHz SSB, 28.400 MHz SSB, 29.220 MHz FM, 52.525 MHz FM, 146.700 MHz FM, 147.000 MHz FM, 438.525 MHz (Brisbane only), regional VHF/UHF repeaters at 0900 hrs Sunday. Repeated on 3.605 MHz SSB & 147.000 MHz FM, regional VHF/UHF repeaters at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ@VKNET.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Garry Herden Maurie Hooper Charles McEachern	VK5ZK VK5EA VK5KDK	1827 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.700 FM Mid North, 146.800 FM Mildura, 146.825 FM Barossa Valley, 146.900 FM South East, 146.925 FM Central North, 147.825 FM Gawler, 438.425 FM Barossa Valley, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 USB, 7.065 USB, 10.125 USB, 146.700 FM, 0900 hrs Sunday	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 351 8873	President Secretary Treasurer	Cliff Bastin Mark Bastin Bruce Hedland-Thomas	VK6LZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 1.825, 3.560, 7.075, 14.116, 14.175, 21.185, 29.680 FM, 50.150 and 438.525 MHz. Country relays 3.582, 147.350(R) Busselton and 146.900(R) Mt William (Bunbury). Broadcast repeated on 146.700 at 1900 hrs Sunday, relayed on 1.865, 3.563 and 438.525 MHz; country relays on 146.350 and 146.900 MHz.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
VK7	Tasmanian Division 5 Helm Street Newstead TAS 7250 Phone (003) 44 2324	President Secretary Treasurer	Andrew Dixon Robin Harwood Terry Ives	VK7GL VK7RH VK7ZTI	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.725 (VK7RNE), 146.625 (VK7RMD), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart) Repeated Tues 3.590 at 1930 hrs.	(F) (G) (S) (X)	$72.00 $58.00 $44.00

VK8 (Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three-year membership available to (F) (G) (X) grades at fee x 3 times

ADVERTISERS INDEX

Com-an-tena ____ 27
Daycom ____ IFC
Dick Smith Electronics IBC, 28, 29
ICOM ____ OBC, 25
Krieger Publishing ____ 55
Radio and Communications ____ 21
Terlin Aerials ____ 5
Tower Communications ____ 37
WIA Membership ____ 13

Trade Hamads

M Delahuntly ____ 54
RJ & US Imports ____ 54
HAMLOG - VK2VN ____ 54

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore, advertisers and advertising agents will appreciate the absolute need for themselves to ensure that the provisions of the Act are complied with strictly.

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

Small, Simple, Powerful

The exciting new FT-51R is Yaesu's third generation 2m/70cm dual-band FM hand-held, with more features and even easier operation than ever before, and all in a size that fits comfortably into the palm of your hand. Its tough polycarbonate front panel and diecast rear casing combines cellular styling with professional grade ruggedness for reliable everyday use, while its new dual-processor design provides really useful new functions such as a Spectrum Scope and scrolling Help messages.

Measuring just 123 x 57 x 26.5mm (H.W.D), the FT-51R provides 2m/70cm Amateur transmit coverage, plus extended receiver coverage of 110-180MHz and 420-470MHz, with selectable AM for Airband reception. The FT-51's two receivers allow flexible VHF+VHF, UHF+UHF, or VHF+UHF operation, while the efficient FET technology provides 2.0W RF output on 2m and 1.5W output on 70cm from the supplied 4.8V 600mA/H Nicad battery pack. Up to 5 selectable Tx power levels are available (including an economy 20mW level), with 5W RF output available when using an optional 9.6V battery pack or mobile power adaptor.

To find local activity easily, the FT-51R's "Spectrum Scope" provides a visual indication of nearby busy frequencies, so you can keep an eye on whether a repeater or simplex channel may be in use. The Spectrum Scope can also be used in memory mode, and will even give an indication of signal strength. In addition to twin VFOs per band, the FT-51R also provides up to 120 memory channels, and alpha-numeric names (eg. repeater locations or callsigns) can be stored instead of a frequency if required.

For very straightforward operation the FT-51R provides scrolling User Help text messages that guide you through most function settings, as well as a selectable Auto Repeater Offset function to suit the Australian band plans. Other features include a range of battery life extenders (Auto battery saver, TX Save and Auto Power Off), CTCSS encode and decode, extensive DTMF-based selective paging, seven selectable frequency Step sizes, and an LCD voltmeter so you can monitor battery performance under load and estimate remaining battery life.

The FT-51R is supplied with a 600mA/H Nicad pack, AC charger, belt-clip, and an efficient hand-held antenna. To learn more about this exciting new transceiver, why not ask for a copy of our colour brochure and 8-page colour Product News booklet, or visit your local Ham store for a demonstration.
Cat D-3622

Stocks Due Mid May

$899

B 2395

FT-51R shown actual size

YAESU

DICK SMITH ELECTRONICS

For further information, orders or the location of your nearest store, call:

SYDNEY AREA 9937 3366

Outside Sydney (FREECALL) 1800 26 3922

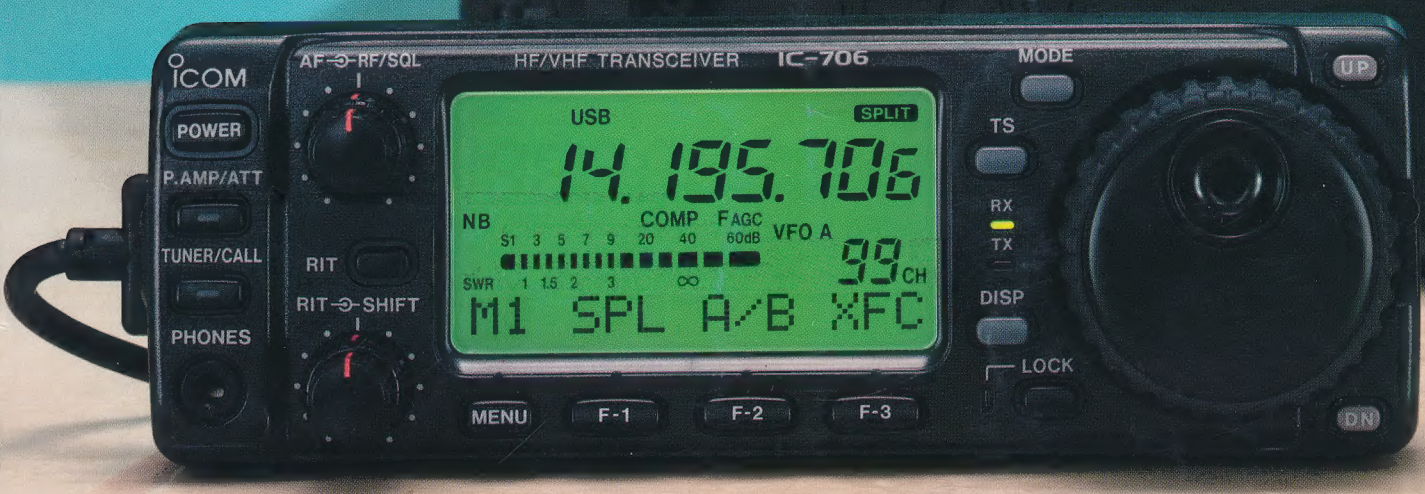
VOL 64, NO 5, MAY 1996

ICOM

706

HF all band + 50 MHz + 144 MHz !

- Powerful 100 W from HF to 50 MHz and 10 W for 144 MHz
- 101 memory channels with dotmatrix display
- All mode including SSB, CW, RTTY, AM and FM.



Detachable front panel mounts any where.

The front panel photo is **Actual size.**

Super compact at 167(W)×58(H)×200(D) mm

Full functions to compete with big rigs

For more information,
call your authorized Icom dealer.

HF/50/144 MHz ALL MODE TRANSCEIVER

IC-706

For the full story contact Icom Australia
7 Duke Street Windsor Victoria 3181
Free Call: 1800 338 915
Ph: (03) 9529 7582 Fax: (03) 9529 8485

A.C.N. 006 092 575